EPA Assessment Database
Version 2.0
for ORACLE

Tutorial

DRAFT

January 2003

Prepared by
Research Triangle Institute
Research Triangle Park, NC

Funded by
EPA Office of Water

Introduction

The US Environmental Protection Agency's (EPA) 305(b) Assessment Database (ADB) software was developed as a tool for state environmental agencies. The EPA supported the development and distribution of the ADB software to ease the burden of state reporting, encourage standardization of reporting between states, as well as to facilitate the generation of the National Assessment Database and the biennial National Water Quality Inventory. The main function of the ADB v.2 is to store assessment information in a way that is consistent with EPA's *2002 Integrated Water Quality Monitoring and Assessment Guidance* (EPA 2001), available at http://www.epa.gov/owow/tmdl/2002wqma.pdf, which addresses 305(b) reports. In the 2002 Guidance, EPA encouraged states to integrate the reporting requirements under Sections 305(b) and 303(d) of the Clean Water Act (EPA 2001). ADB v.2 is designed to facilitate the integration of the two programs. The ADB v.2 can also produce the attainment category report, as defined by the *Guidance*, based on the assessment information in the database. This report can be exported from the database in tabular format.

System Overview

The ADB v.2 is a relational database application based on an ORACLE database with a Visual Basic user interface. The ADB was moved from Microsoft Access to ORACLE to expand the network capability of the ADB. The ADB includes two files, a user interface file and a database file. The user interface file must be installed locally on each user's machine. This file contains all of the graphical screens and tools that allow the user to enter and view data. The second file is a database file (ORACLE 8.1.x) that stores all of the data. This file may be stored on an individual machine or on a server to allow access by multiple users. One of the advantages of this two-file design is that the graphical interface can be improved without affecting the table structure or data stored in the database file.

Getting Started

Installing the ADB

For detailed instructions on installing the ADB, see Appendix A of the ADB Users Guide, available at www.epa.gov/waters/adb. There are two parts to the installation of the ADB, installing the user interface (data entry and viewing forms) and the database (the actual Oracle data tables). You may want to have your ORACLE database administrator (DBA) do the database installation for you.

Your DBA can also set up users for the ADB. There are two kinds of ADB users, "Administrators" and "Users". Personnel who have been assigned the "Administrator" role can

Add, Delete and Modify data. Personnel who have been assigned the "User" role can only view data. The ADB v.2 comes with a default user called ADBUSER (this is also the password). ADBUSER has administrative privileges, so you can enter all of your assessment data using this log in if you wish. You can also have your DBA remove ADBUSER if database security is a concern. In order to do this tutorial, you must log into the ADB v.2 as a user with administrative privileges.

Starting the ADB

After you install the ADB Interface, you will have a new item on your **Start->Programs** menu in Windows called **ADB v.2**. Select ***ADB v.2*** from this menu to start the application. You will be prompted to enter the database name, a user name and password. Check with your Oracle DBA to see what the appropriate entries in this dialog are. The default log in is "ADB" for database name, "ADBuser" for user name, and "ADBuser" for password.

The first time you start the ADB, you will be prompted to select what state and cycle you will be working with. The ADB will default to the state and cycle you select the next time you start the ADB.

Installing the Sample Data

Unzip the contents of the ADB_SampleData.zip file into a folder called "ADB_SampleData on your C: drive.

Exercise 1. Exploring ADB v. 2

In this exercise you will explore the organization and functionality of the ADB. We will start by looking at the Browse features, which allow you to very quickly find information that you are looking for in the ADB v.2. You will also learn how to add documentation required by the *Guidance* to the ADB and review some of the ADB v.2 data entry screens. In Exercise 2 we'll use these screens to add a new Assessment Unit (AU).

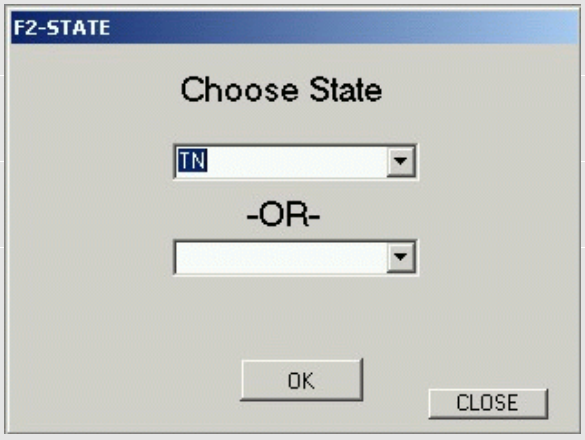
ADB v.2 Organization

ADB v.2 is organized around "Assessment Units" (AUs). These AUs replace the "Waterbody Segments" from ADB v.1. There is no longer a "waterbody" level like there was in ADB v.1, and users can now define AUs that contain more than one kind of waterbody type (e.g. lakes, reservoirs, etc). In ADB v.2 users assign ID's directly to the AU. There are no required conventions for setting up unique ID's for the AUs and they can be up to 50 characters. However, it is highly recommended that your AU IDs start with your two-letter state abbreviation.

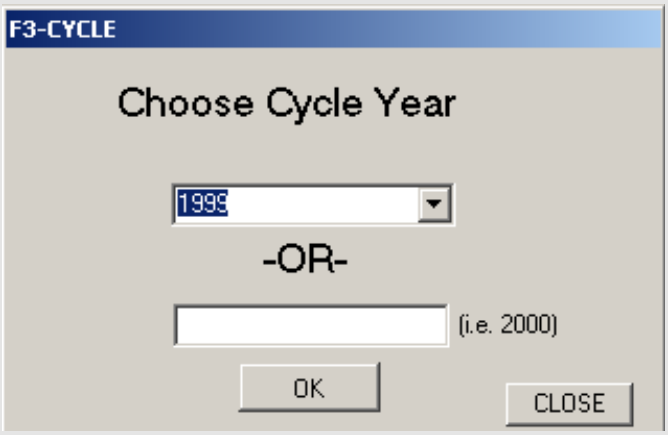
1. Open the ADB and log on by entering the following:

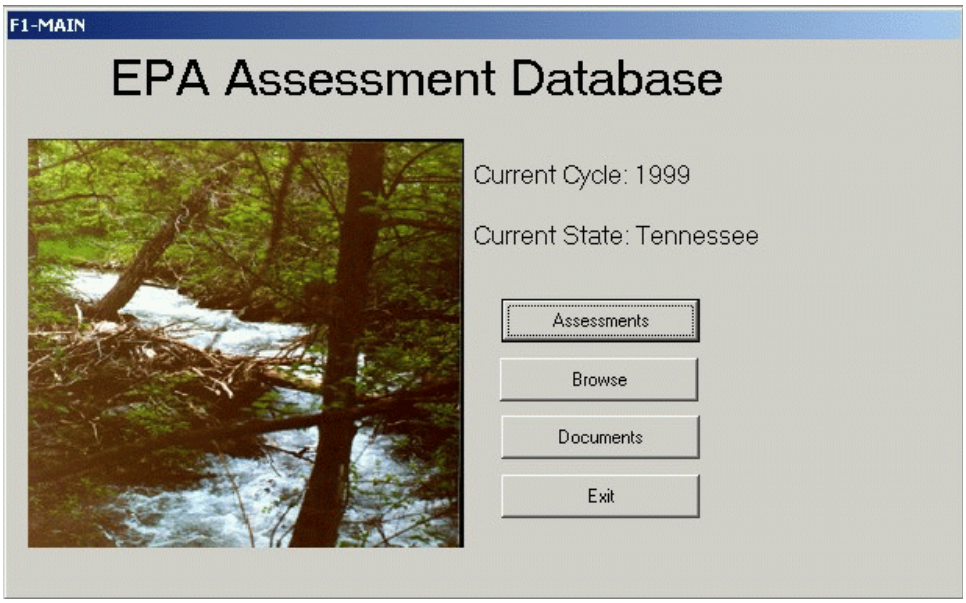
   Database Name: **ADB**
   User: **ADBUSER**
   Password: **ADBUSER** (or check with your DBA for the appropriate password).

2. Specify ***TN*** for state and click **OK**.



3. Select ***1999*** for the *Choose Cycle Year* dialog box and click **OK**.





This is the main screen for the ADB v.2. The main screen has four buttons you can use:

Assessments - If you log into the database as a user with administrative privileges, you may make changes to the assessment data in the database using this button.

Browse - You can use this button to view data in the database even if you do not have administrative privileges.

Documents - This button allows you to attach the Monitoring Strategy Document and the Assessment Method Document, which are required by the *Guidance*.

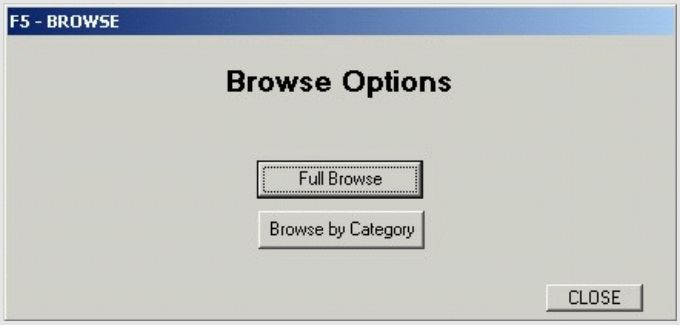
Exit - This button will close the ADB v.2

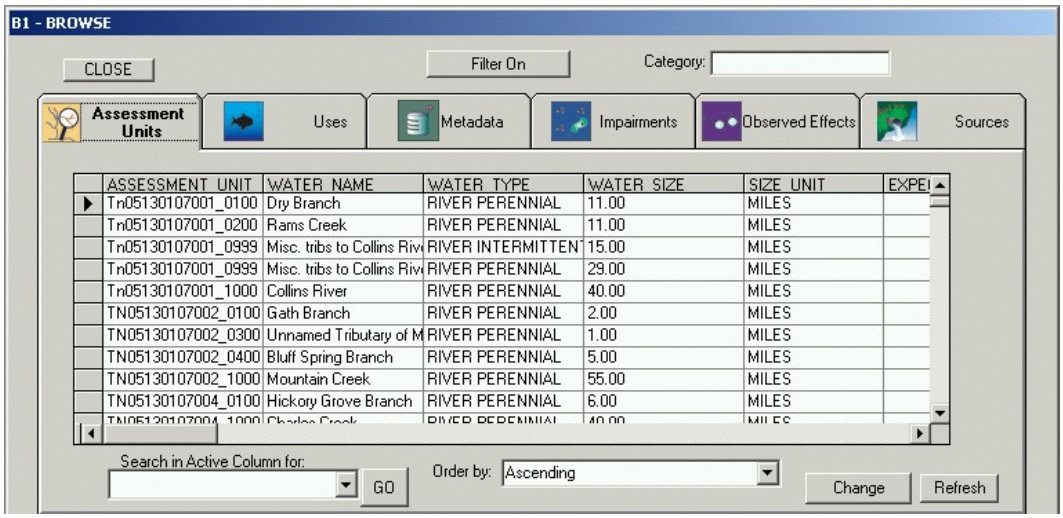
Browse

The *Browse* features provide a very quick and easy way for you to access information in the ADB. You do not need to have Administrative privileges to access the Browse features, so this is also a nice way to make information available to people in your agency.

Full Browse

➢ Click on the **Browse** button, then click on the **Full Browse** button.

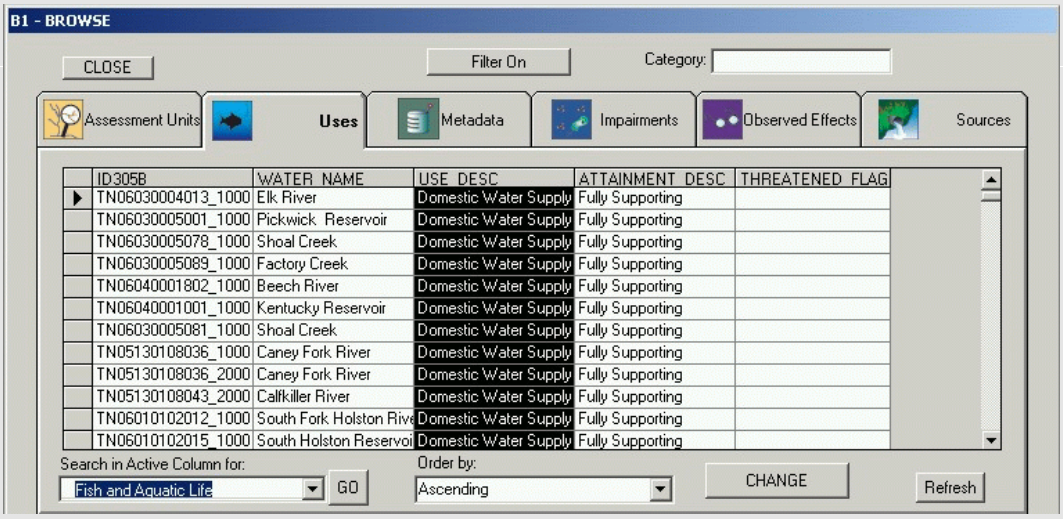




The *Full Browse* option allows you to see all of the data in the database by tabbed sections. You can click on the different tabs to view the different types of data in the ADB v.2. When examining the tables, you can click on the field names and the table will be sorted by that

field. You can control the sort order using the *Order by:* drop down list. Clicking on a field name also populates the *Search in Active Column for:* list box with all of the values from that field. This allows you to quickly locate values you are interested in.

1. Click on the *Uses* tab and then click on the *USE DESC* field. This sorts the table by Use Description.



2. Pick ***Fish and Aquatic Life*** from the *Search in Active Column for:* drop-down list. Click **GO**. This will take your pointer to the first record that has *Fish and Aquatic Life* in the *USE DESC* column.

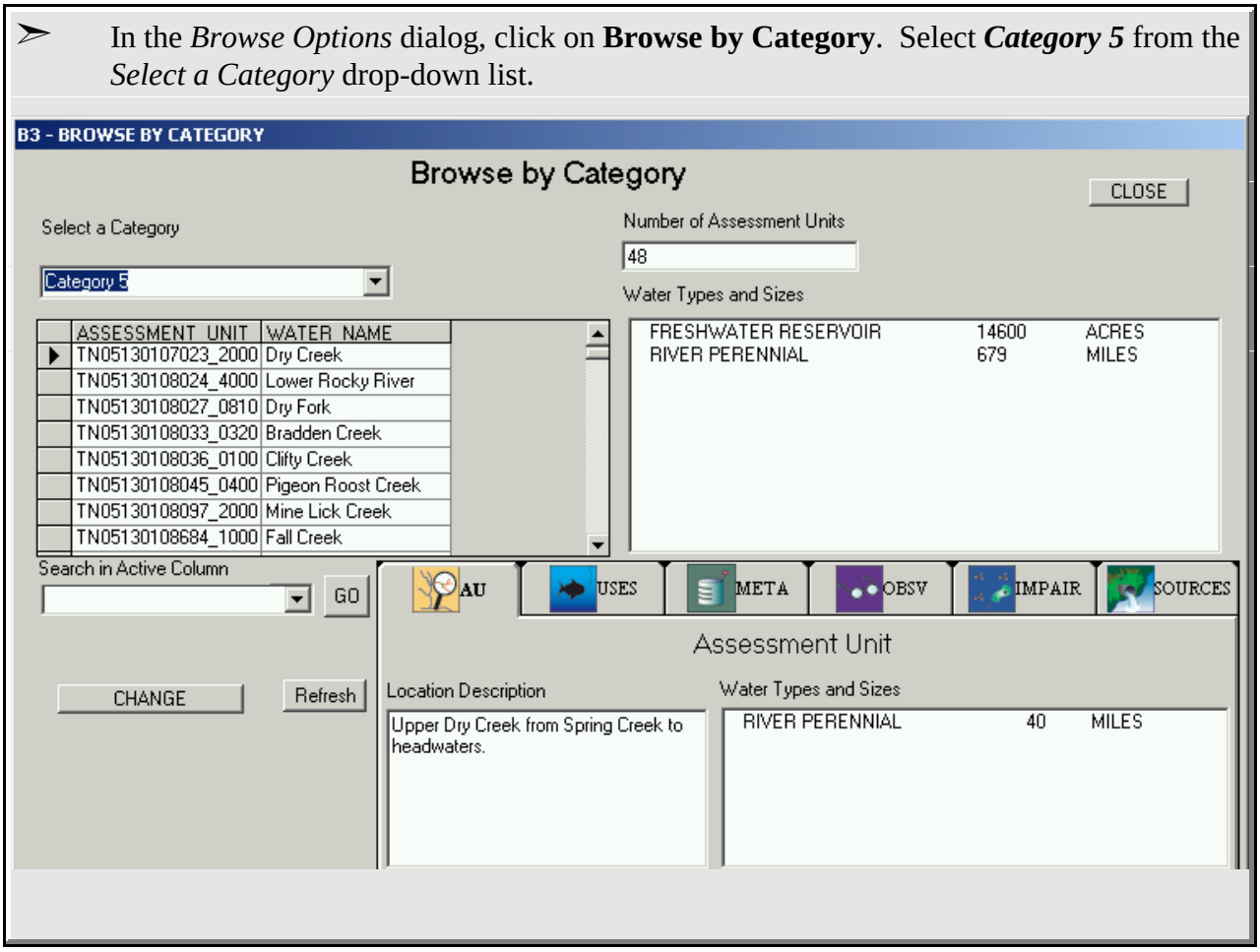
You can scroll through the list and see which AU's are Fully Supporting Aquatic Life Use, which are Not Supporting and which ones have insufficient information. You can search for data in other tabs in the same way. Feel free to examine the other data available through this *Browse* feature.

➢ Click **Close** when you are finished.

Browse by Category

This dialog has the same tabs as the previous dialog, however, the information shown for each tab only applies to the AU that is currently selected in the *Assessment Units* table on the upper left part of the screen. This table behaves similarly to the other browse tables in that you can sort the table by clicking on one of the columns, and you can also search for values in the active column. This is particularly useful if you want to look at the information associated with a specific assessment unit.

➢ In the *Browse Options* dialog, click on **Browse by Category**. Select ***Category 5*** from the *Select a Category* drop-down list.



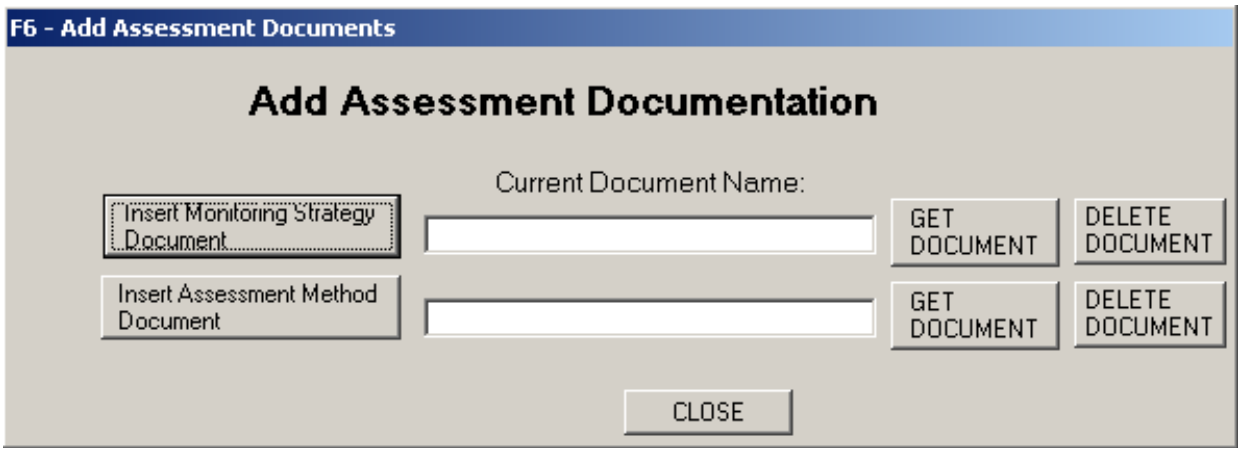
The database selects all the Assessment Units that are in Category 5. These are Assessment Units that are impaired or threatened for one or more designated uses by a pollutant(s), and require a TMDL. The database also lets you know how many Assessment Units are in this category.

➢ Click on the **CLOSE** button. Also **CLOSE** the *Browse Options* dialog box.

Documents

Your state's Monitoring Strategy Document and Assessment Method Document are required by the *Guidance*. The *Documents* feature of the ADB allows you to add these documents directly to the database.

➢ In the main database dialog box, click on the **Documents** button.

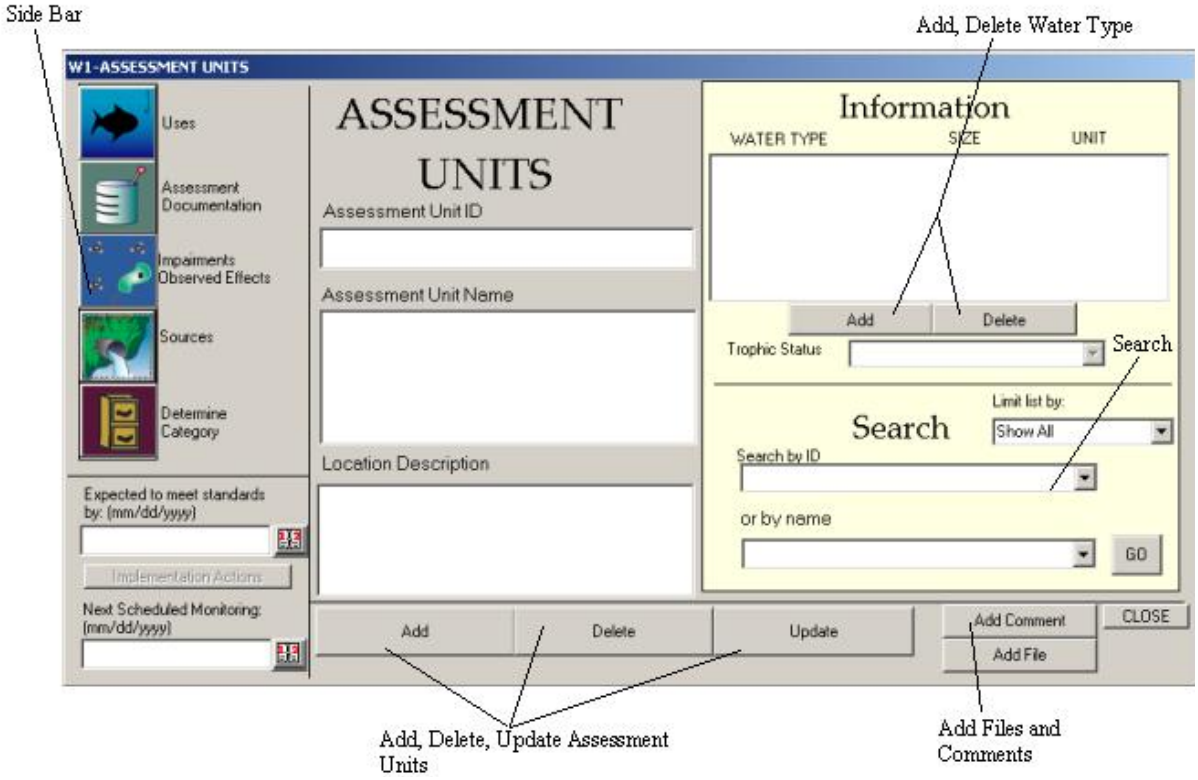


You can use the **Insert Monitoring Strategy** button or the **Insert Assessment Method** button to add these documents to the database. The **Get Document** button allows a document already associated with the database to be downloaded and viewed. The **Delete Document** buttons will remove the document from the database.

➢ Click **CLOSE** to return to the main database screen.

Assessments

➢ In the main database screen, click on the **Assessments** button.



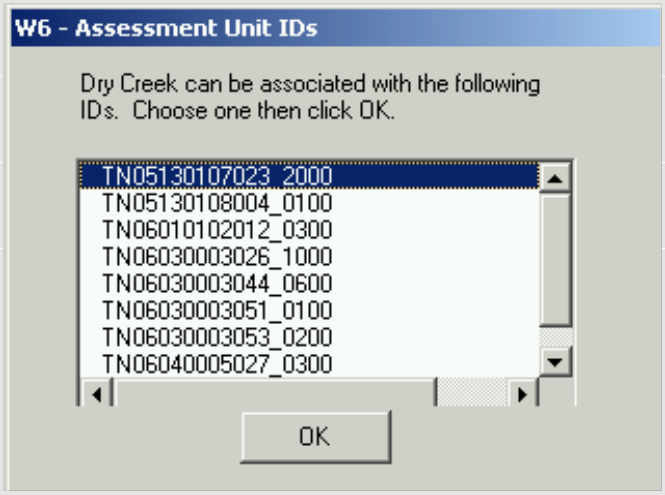
When *Assessments* is selected from the main dialog, the user is able to access assessment information for any AU in the database. You can view, add, update, or delete assessment information from this screen. You can select an existing AU from the *Search* drop-downs in the lower right hand corner of the dialog using their ID or Name.

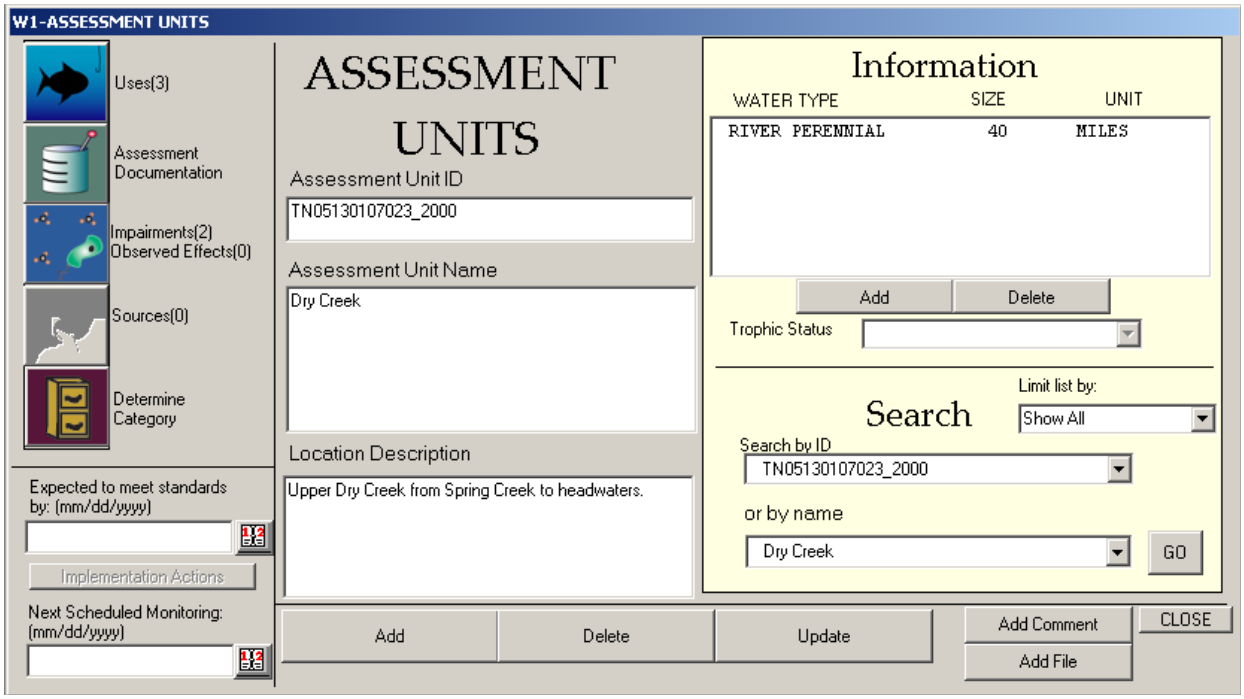
Assessment information associated with an AU may include designated uses, assessment metadata, causes of impairment (or observed effects), sources of impairment, and assessment category. You can access this information using the button bar on the left side of the dialog.

➢ In the *Search* dialog box, choose ***Dry Creek*** from the *or by Name* drop-down list and click **GO**.

Dry Creek is associated with several Assessment Units. We need to choose one before we can look at Assessment Unit information.

➢ Select ***TN05130107023_2000*** and click **OK**.





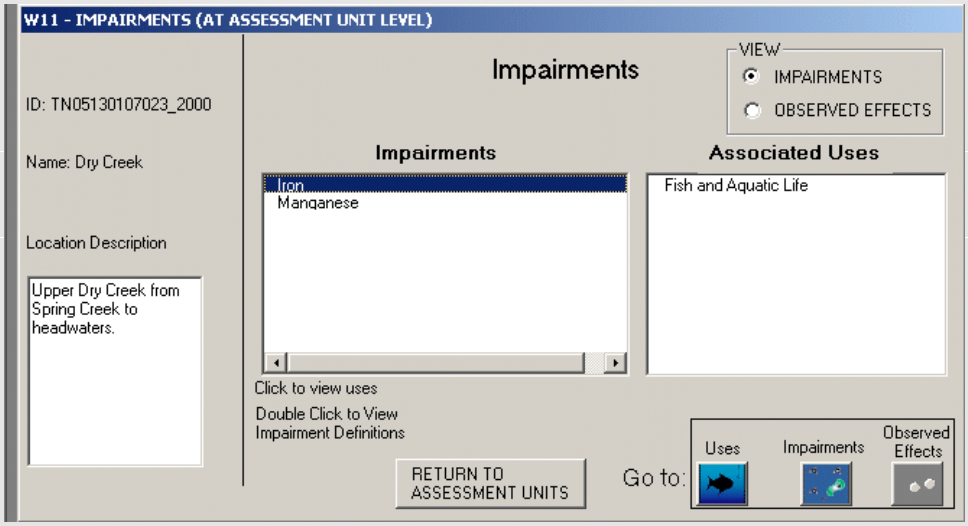
The database will retrieve information for the Assessment Unit you specified. It displays the *Assessment Unit ID*, as well as the *Location Description* and the *Water Type* and *Size*. The sidebar buttons give some additional information about the Assessment Unit. The text beside the

buttons on the left will indicate whether or not there is information for each of those data elements and, if so, how many uses or impairment sources, etc. exist. The sidebar indicates this Assessment Unit has three Uses and two Impairments.

➢ Click on the **Impairments** button 

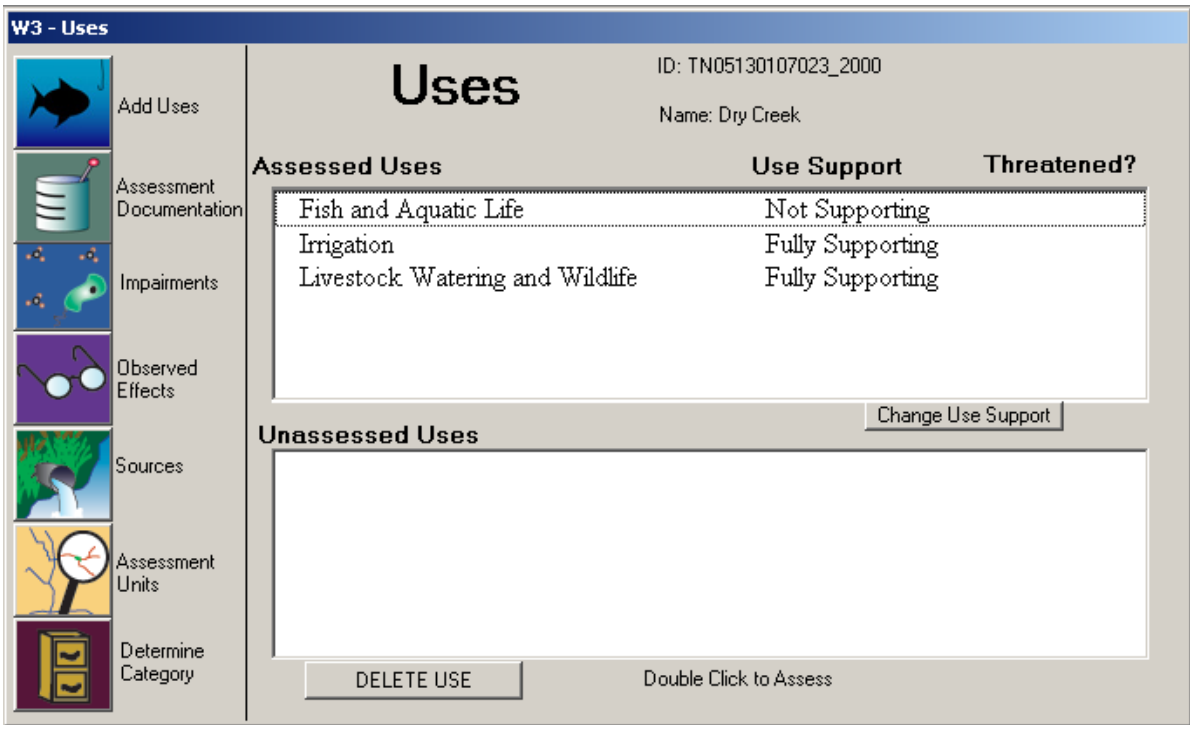
Clicking on the **Impairments** button from the *Assessment Units* screen gives you information at the Assessment Unit level. This *Impairments* dialog indicates the Impairments for this Assessment Unit are Iron and Manganese. You can click on either of these to see the associated Designated Uses or you can double-click on either of them to view impairment definitions.

1. Click on ***Iron***, then on ***Manganese***. Under *Associated Uses*, you can see that Fish and Aquatic Life is impaired by both of these metals.



2. Click on the **Uses** button at the bottom right of the screen.

The ***Uses*** screen displays the Designated Uses that have been assigned to this AU. As you can see, the *Fish and Aquatic Life* use, which is impaired by Iron and Manganese, is *Not Supporting* its Designated Use.



➢ Click on the **Assessment Units** button to return to the main Assessment Units screen 

Summary

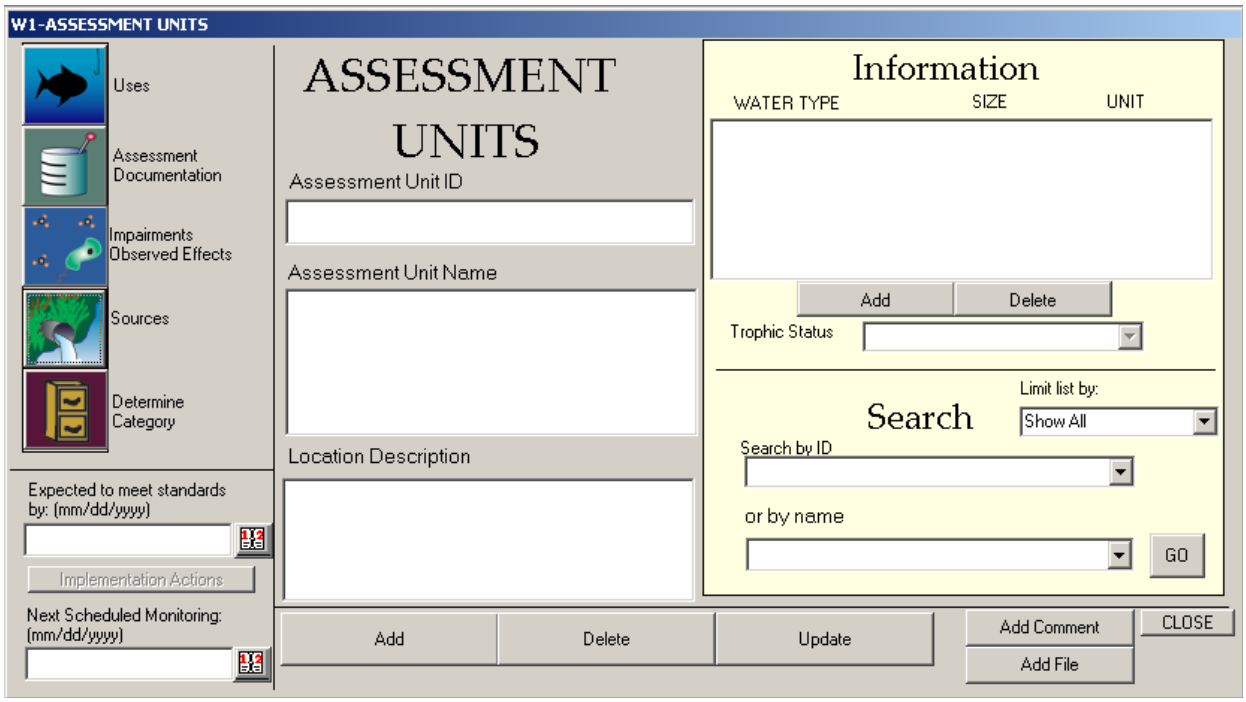
In this exercise, you learned to view and sort data in the ADB using the *Browse* features. You learned how to add a Monitoring Strategy document and Assessment Methodology document to the ADB. You also learned about the main *Assessment Units* screen and how to view data in the ADB by using the sidebar buttons on the *Assessment Units* screen.

In Exercise 2, you will learn how to add new Assessment Units to the Assessment

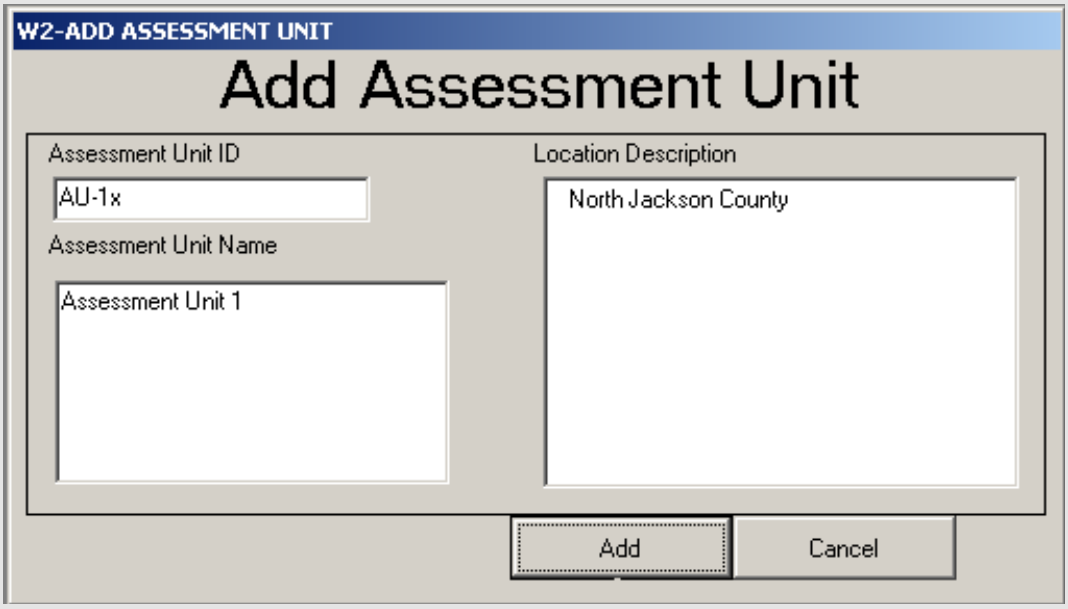
Database and how to assign designated uses and assessment information to these new Assessment Units.

Exercise 2. Adding an Assessment Unit

In this exercise you will learn how to add a new AU to the ADB v.2 and how to assign designated uses and enter your use assessment information. You will also see how the ADB v.2 automatically assigns the AU's to the categories defined in the *Guidance* and learn how to export a category report table.



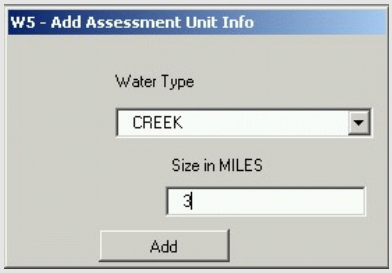
➢ Click on the **Add** button at the bottom of the Assessment Units screen. A dialog box will appear requesting that you add *Assessment Unit ID, Name,* and *Location*. A brief *Location Description* is required. The database will not allow you to proceed without entering information in this box. Fill out the dialog box using the following information (*please read the note below first*) and then click **Add**.



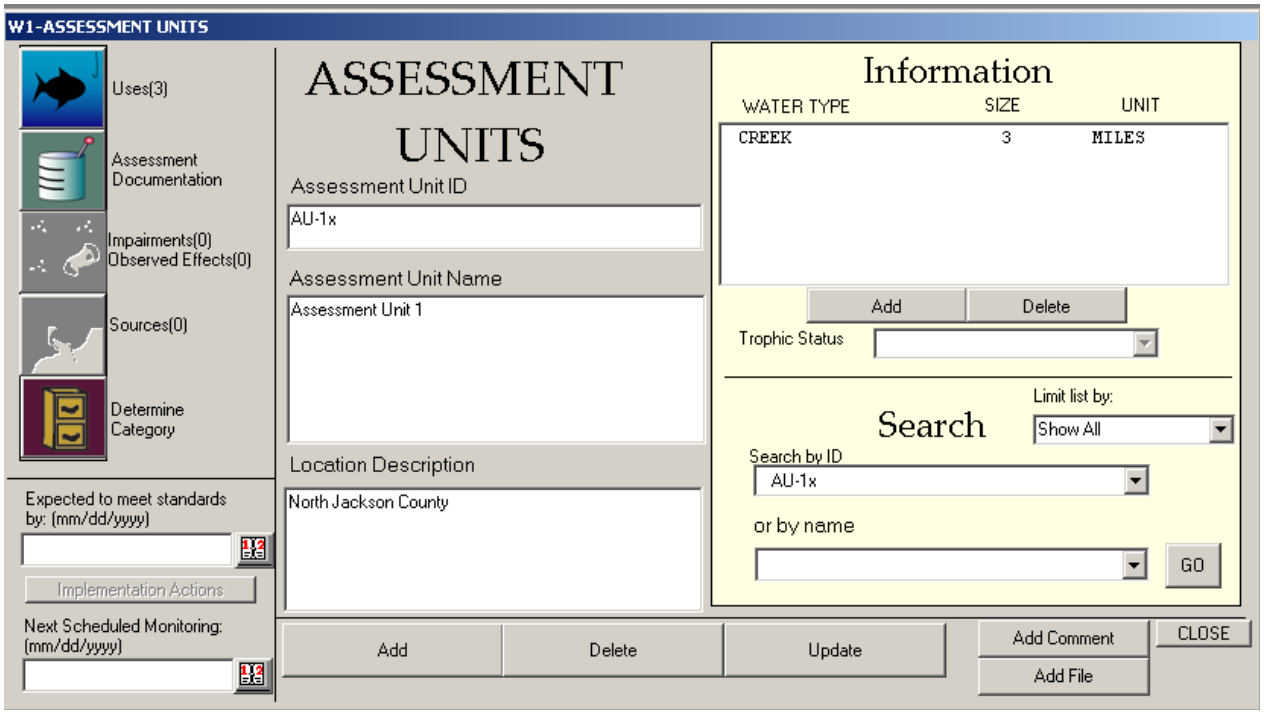
Note: If you are attending a class where you are using the ADB v.2 with Oracle over a network, each student must have their own Assessment Unit ID. Otherwise, we will all be accessing the same record which will cause problems with the exercise. The instructors will assign you a letter to use in place of the **x.** So if the instructors assign you the letter "a", each time you see "AU-1***x***" use "AU-1a".

Next, a dialog box will appear requesting you add Assessment Unit Information. The *Water Type* drop-down list contains a number of different kinds of waterbodies that you can choose from to describe the water in your Assessment Unit. Your Assessment Units can be composed of multiple waterbody types, but you need to define one type first, then you can define the others later. The *Size* units are dependent on the *Water Type* that you choose.

➢ Fill in the information according to the following example and click **Add**:



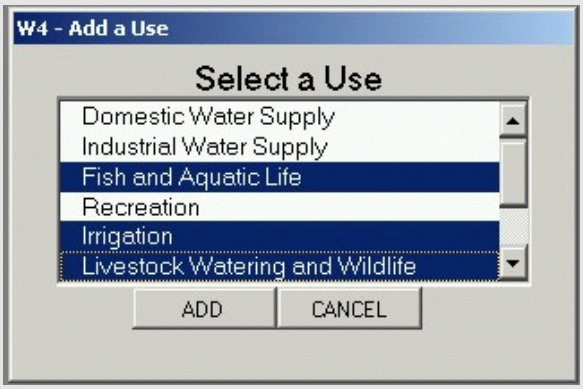
The information you just entered will be displayed on the Assessment Unit screen.



Now, we need to enter the Designated Uses associated with this Assessment Unit.

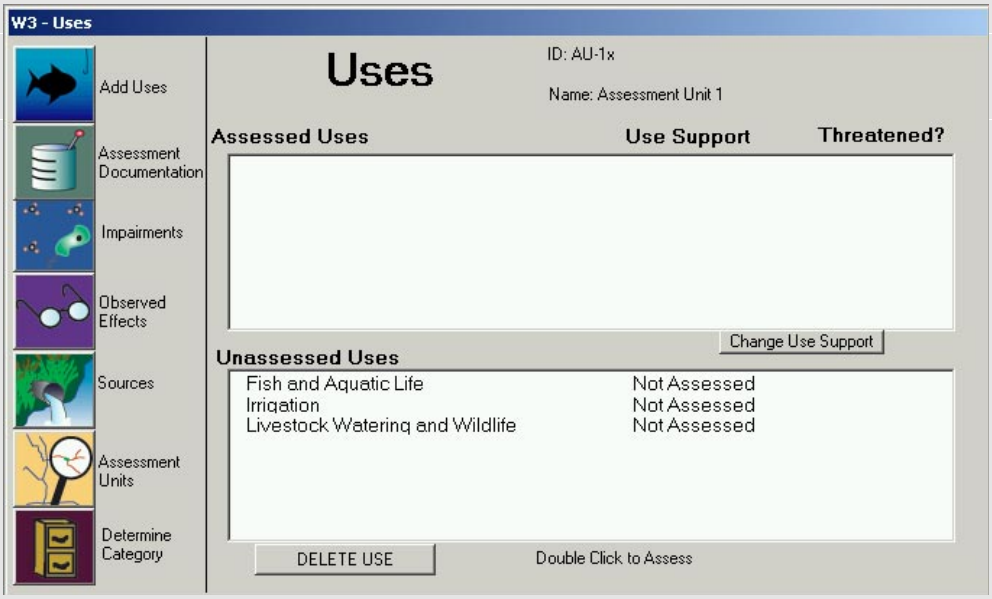
1. Click on the **Add Uses** button 

2. Select the following uses (you can hold down the **Control** key to select non-sequential items in the list) and click **Add**.



Note: The Designated Uses in the *Select a Use* dialog box are from EPA's Water Quality Standards Database (WQSDB) and the States' Water Quality Standards documents. If a Use is not specified in your Water Quality Standards document, it will not be available to choose in this list. For more information on the WQSDB visit http://www.epa.gov/wqsdb/.

The *Uses* screen appears showing *Fish and Aquatic Life, Irrigation,* and *Livestock Watering and Wildlife* as *Unassessed Uses.*



Assessment Metadata

Before you can assign a use support for a designated use, you must enter *Assessment Metadata*. The metadata choices in the database should reflect the decision logic in a state's assessment methodology document. The required metadata elements are *Assessment Type* and *Quality*. Descriptions of the options for both choices are below.

Types of Assessments

Biological: A biological assessment can include any type of biological (bioassessment) indicators that were used (e.g., macroinvertebrate indicators, fish-IBIs, etc.).

Habitat: A habitat assessment can include habitat indicators or other types of geofluvial analyses related to such features as riffle and pool analyses, substrate, bank stability, and stream buffer zone plant cover analyses.

Physical/Chemical: This is a broad category that can include any number of different types of analyses. Physical monitoring involves measures for such system properties as pH, turbidity or temperature. Chemical monitoring is typically performed for specific analytes (e.g., copper) that can be defined through reference to CAS registry numbers. If clearly defined in a state's assessment methodology document, this category could cover the xenobiotic chemical pollutants in tissue residues associated with fish or wildlife consumption advisories.

Toxicological: This category includes use attainment conclusions based on such methods as bioassays. These can include acute or chronic bioassays for ambient water or for interstitial pore water. Other types of monitoring information may be relevant depending on how toxicity concerns are addressed in a state's assessment methodology document. For instance, if clearly defined in a state's assessment methodology document, this category could cover the xenobiotic chemical pollutants (e.g., mercury/methyl-mercury) in tissue residues associated with fish or wildlife consumption advisories. This category would also be appropriate to document biogenic toxics concerns related to red tides, cyanobacteria toxins, toxins from Pfestieria, or other harmful algal blooms (HABs).

Pathogen Indicators (Microbials): This assessment type can include any standard pathogen (microbial) indicators. An example of a pathogen indicator would be *E. coli* counts. It can also include conclusions from screening test determinations for actual bacterial and viral pathogens (e.g., tests for *Crytosporidium*).

Other Public Health Indicators: Other indicators related to public health (i.e., oil spills) that could not be categorized by other Assessment Types.

Other Aquatic Life Indicators: Other indicators related to Aquatic Life that could not be categorized by one of the other Assessment Types.

When making entries into the ADB, the user should be certain that a given metadata category is related to the specific use being assessed. For example, it probably would not make sense to have a *Habitat* assessment associated with a *Primary Contact Recreation* use. The State's Assessment Methodology Document should describe what types of assessment metadata categories can be associated with each WQS designated use.

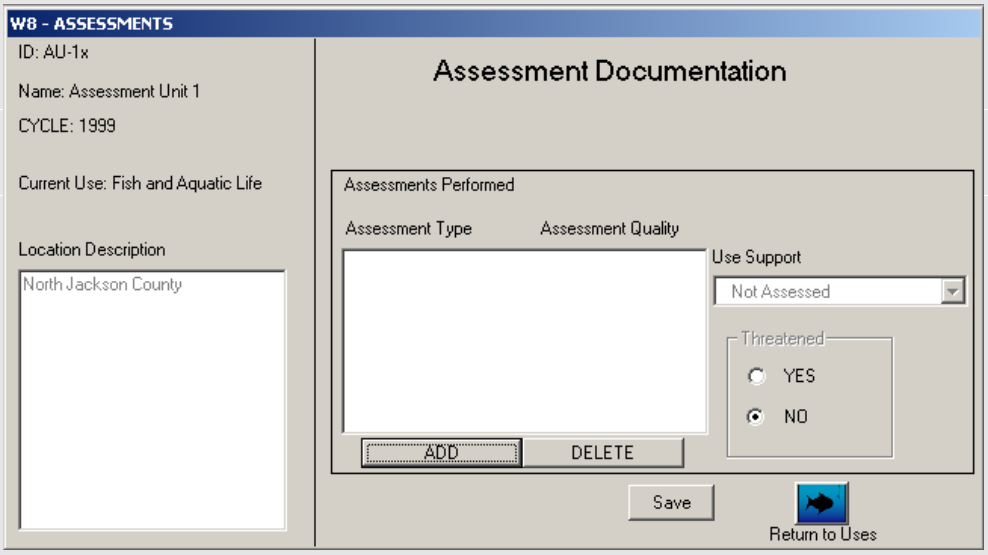
Assessment Quality

The database requires that a statement be made about the quality of the assessment, or the quality of the data used to make the assessment. The database has defined four levels of quality on a scale of 1 to 4 with 1 being the lowest and 4 being the highest.

1. Low Quality
2. Fair Quality
3. Good Quality
4. Excellent Quality

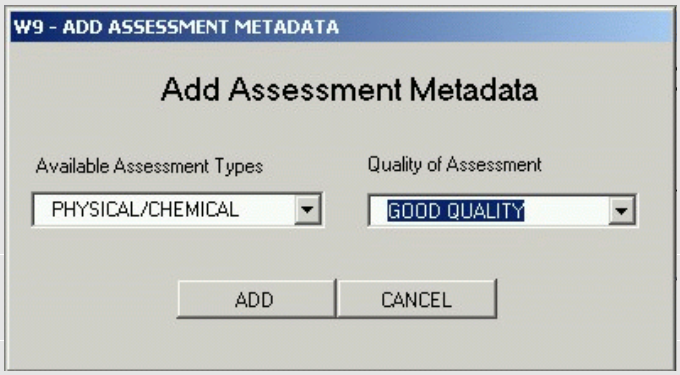
How a state assigns these levels of quality should be explained in their Assessment Methodology Document.

1. Double-click on ***Fish and Aquatic Life*** to add an assessment to that Designated Use.

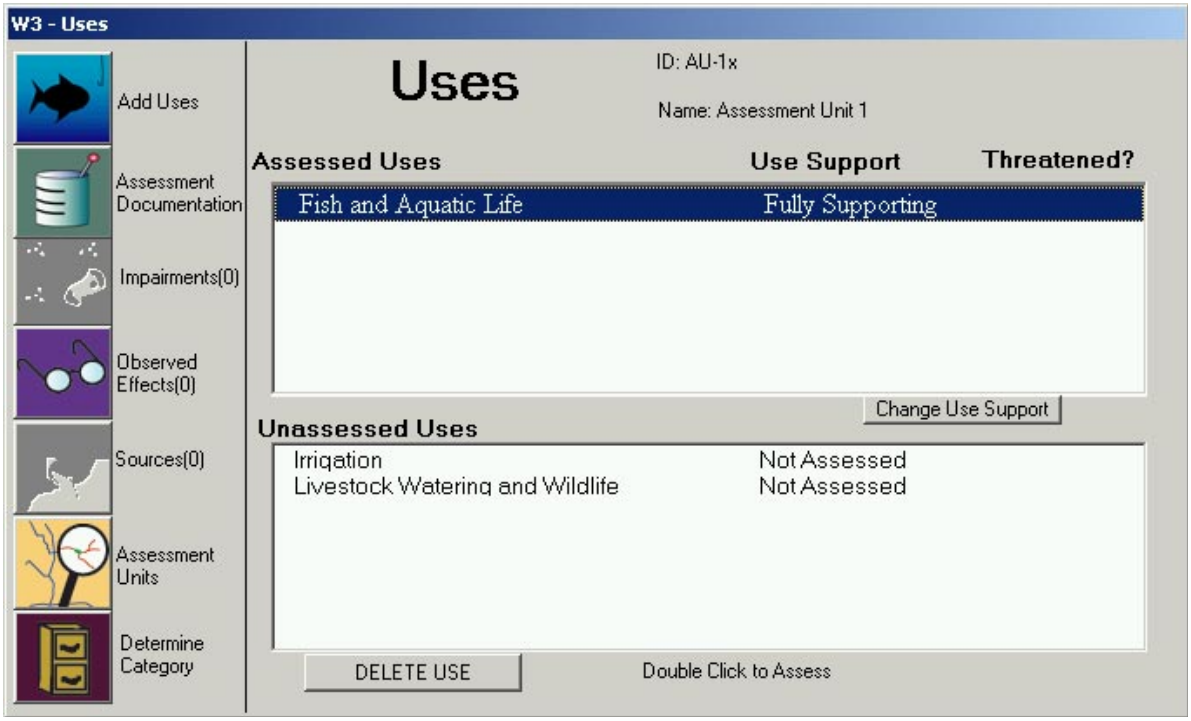


2. In the *Use Support* drop-down box on the *Assessment Documentation* dialog, choose ***Fully Supporting*** and click **Save**.

3. In the *Assessment Documentation* dialog, click on **Add** to specify an Assessment Type. Fill in the *Add Assessment Metadata* dialog with the following information and click **Add**.



4. Click **Save** and then click on the **Return to Uses** button. 



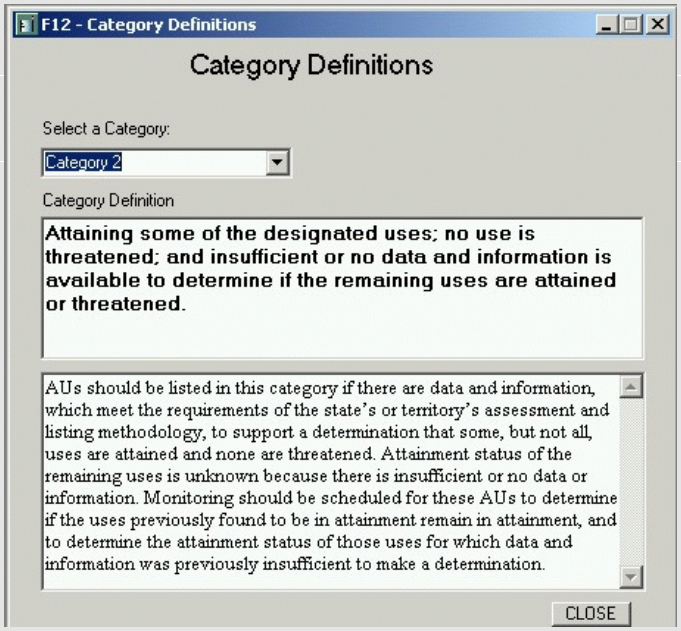
EPA's *2002 Integrated Water Quality Monitoring and Assessment Report Guidance* calls for each Assessment Unit (AU) to be placed in one of five unique assessment categories. The ADB v.2 will automatically assign AU's to the appropriate category based on information you enter about the use support rating of the assessment unit. You can view the category definition assigned to an AU by clicking on the **Determine Category** button in the button side bar. You can read a detailed description of each category in the *Guidance*, and you can also get a description of each category in the database by selecting ***Show Category Definitions*** from the ***View*** menu.

1. Click on the **Determine Category** button 

A text box will appear indicating that the Assessment Unit is in **Category 2** because it is attaining one of its designated uses (Fish and Aquatic Life) and the other two uses are unassessed (Irrigation, Livestock Watering and Wildlife)

2. Click **OK**.

3. On the database menu, click on ***View*** and select ***Show Category Definitions***. Select ***Category 2*** from the *Select a Category* drop-down list.



Look at several more of the categories, and click **Close** when you are finished.

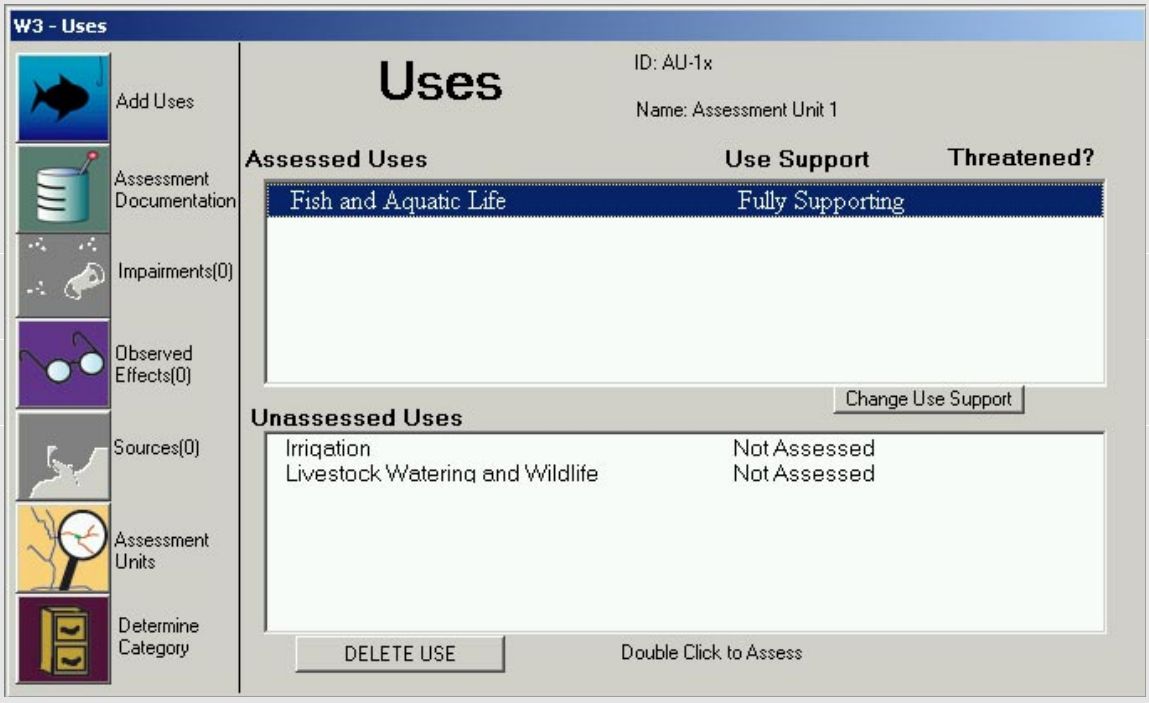
4. Click on the **Assessment Units** button on the *Uses* dialog to return to the main *Assessment Units* screen. 

Updating Assessment Information

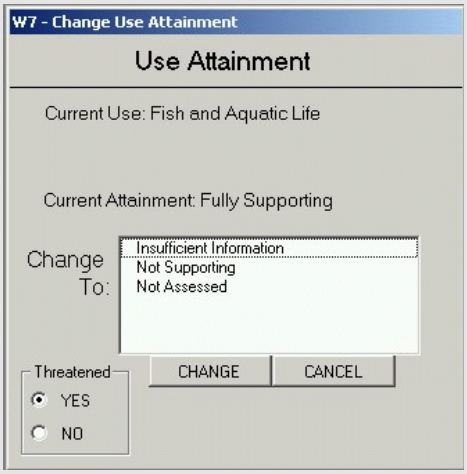
You receive some new data about the assessment unit you've entered that leads you to believe the water quality standard for *Fish and Aquatic Life* is threatened for this AU. This would mean that the assessment unit is currently attaining its water quality standard for the *Fish and Aquatic Life* use, but that you predict it will not be attaining the water quality standards by the next reporting cycle.

1. From the main *Assessment Units* screen, make sure ***AU-1x*** is specified as the *Assessment Unit ID.* Click on the **Uses** button 

2. Select ***Fish and Aquatic Life*** from the *Uses* dialog box and click on the **Change Use Support** button.



3. In the *Use Attainment* dialog, click the **Yes** radio button under *Threatened* and then click the **CHANGE** button.

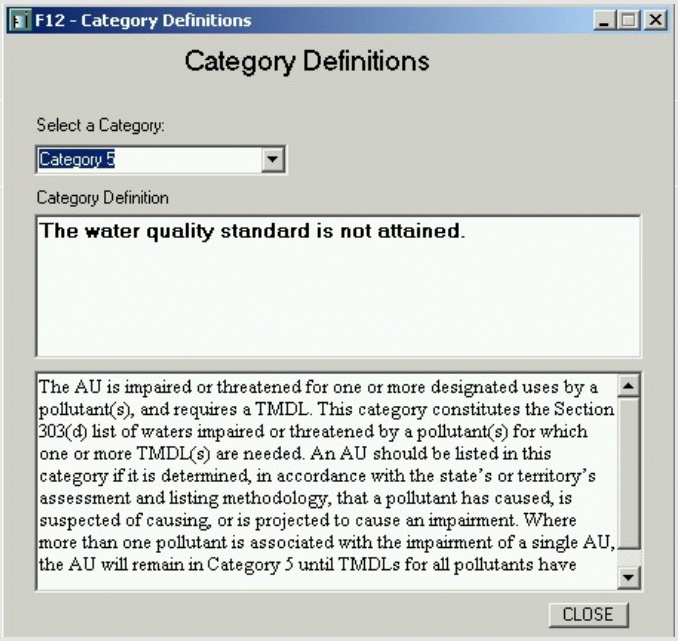


The "Y" beside *Fish and Aquatic Life* indicates this use is threatened.

4. Now click on the **Determine Category** button 

5. Adding a "Threatened" designation to the Assessment Unit moved it from Category 2 to Category 5. Click **OK** in the message box.

6. From the ***View*** menu, click on ***Show Category Definitions*** and select ***Category 5***.



7. The definition indicates that a TMDL is required, we will enter this information later in Exercise 5. **Close** the *Category Definitions* box.

8. Click on the **Assessment Units** button to return to the main *Assessment Units* screen

Export Category Listing

You can export a list of Assessment Units and their Categories to a comma-delimited text file (.csv).

1. Go to the menu toolbar and select ***Data->Data Exports***.

2. Pick ***Category Listing*** from the drop-down list and click **Export Data**.

3. Save the category.csv file in your ADB_sampledata directory

4. **Close** the Data Exports dialog box when the Exporting Data status bar at the top is no longer visible.

➢ If you have Excel on your machine, try opening the category.csv file. (In Excel, choose "All files (*.*)" from the "Files of type" dropdown list)

ASSESSMENT_UNIT	CYCLE	WATER_NAME	Category
AU-1x	1999	Assessment Unit 1	5
TN05130107002_0100	1999	Gath Branch	1
TN05130107002_0300	1999	Unnamed Tributary of Mountain Creek	4A
TN05130107002_0400	1999	Bluff Spring Branch	1
TN05130107002_1000	1999	Mountain Creek	1
TN05130107004_0100	1999	Hickory Grove Branch	2
TN05130107004_1000	1999	Charles Creek	1

If you have a GIS coverage that has the same ID's that are stored in the Assessment_Unit field, you can join this table to your GIS coverage and display the categories for your state's waters.

Summary

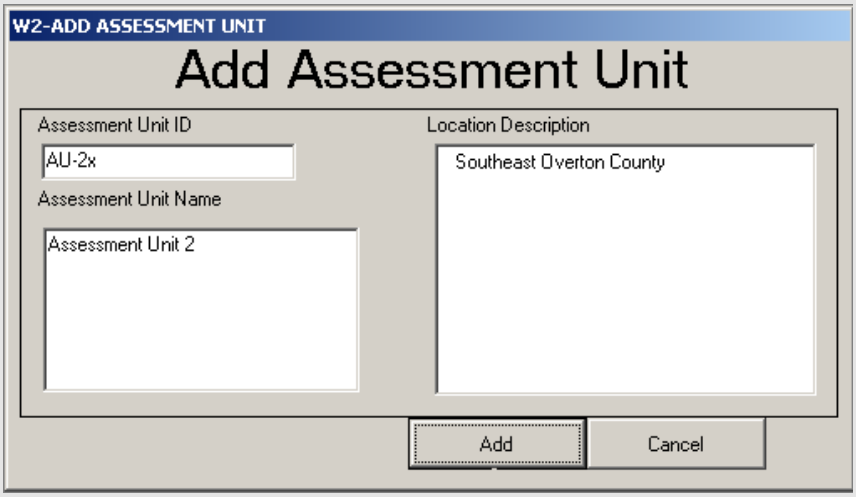
In this exercise, you learned how to add an Assessment Unit to the ADB. You also learned how to add Designated Uses to the Assessment Unit. You learned how to view the Category for an Assessment Unit and you saw how changing the Use Support for an Assessment Unit can change its Category listing. Finally, you learned how to export a table of category listings for use outside of the ADB v.2.

In Exercise 3, you will learn how to enter impairments and sources into the ADB v.2. You will also learn about Observed Effects and how to enter them in the database.

Exercise 3. Adding an Impairment to an Assessment Unit

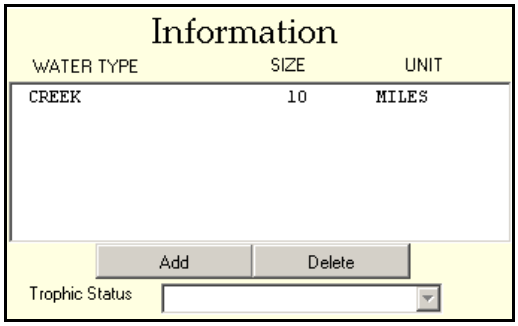
In the last exercise we added an AU to the database, assigned designated uses and entered information about use support. In this exercise you will learn how to enter impairments that affect use support, as well as the sources of these impairments. You will also learn how to add Observed Effects, which are factors that you observe while you are doing your assessments. These factors may affect use support, but are not specified as impairments in your state water quality standards.

1. From the main *Assessment Units* dialog box, click **Add**. Fill in the *Add Assessment Unit* dialog box with the following information and then click **Add**.



2. For the *Waterbody Type*, select ***Creek***, and enter **10** for *Size in Miles*. Click **Add**.

This assessment unit also includes a lake. In the ***Information*** screen, you will see the *Creek* waterbody type. You can add additional water types by clicking on the **Add** button just below Water Type.



1. In the *Information* screen, click **Add**. Choose ***Freshwater Reservoir*** for *Waterbody type* and **5** for the *Size in Acres*. Click **Add**.

2. Now that the waterbody types have been added to the Assessment Unit, we need to add Uses. Click on the **Add Uses** button 

3. Choose ***Domestic Water Supply*** and ***Fish and Aquatic Life*** for ***Uses*** (you can hold down the **Control** key to select non-sequential items in the list) and click **Add**.

4. Double click on ***Domestic Water Supply*** under *Unassessed Uses* to add assessment information.

5. For *Use Support*, pick ***Not Supporting***.

6. In the *Assessment Documentation* dialog box, click **Add**. The *Assessment Metadata* dialog box will appear.

Let's assume that the water in the Assessment Unit has just been tested and was found to be contaminated with Fecal Coliform bacteria. This could be considered an Excellent Quality Assessment type because it was based on recent water quality tests.

1. For *Assessment Type*, pick ***Pathogen Indicator*** and for *Quality of Assessment* pick ***Excellent***. Click **Add**.

2. Now click **Save** at the bottom of the screen and click the **Return to Uses** button 

3. Now double click on ***Fish and Aquatic Life*** under *Unassessed Uses*.

4. For ***Use Support***, pick ***Fully Supporting***.

5. This assessment is being made based on five-year old data about the habitat in this AU. In this example, this could be considered a Fair Quality Assessment type. Click the **Add** button. Choose ***Habitat*** for *Assessment Type* and ***Fair Quality*** for *Quality of Assessment*. Click **Add**. 

6. Now click **Save** at the bottom of the screen and click the **Return to Uses** button.

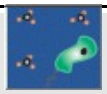
So far, you have added an Assessment Unit that has two waterbody types. You have assigned two uses to the Assessment Unit. One of these uses is impaired based on a high quality assessment and the other is fully supporting its use based on a fair quality assessment.

1. Click on the **Determine Category** button. 

   When the message appears indicating the Assessment Unit is in Category 5, click **OK**.

2. Check the category definition by looking under the ***View*** menu and selecting ***Show Category Definitions***. The Assessment Unit is in Category 5 because it is not supporting one of its Designated Uses. Close the Category Definitions box.

Now you need to identify the impairment and the source of this impairment for the Domestic Water Supply use.

➢ In the *Uses* screen, click on ***Domestic Water Supply*** under *Assessed Uses*. Click on the **Impairments** button 

The *Impairments* screen will appear. Since there are more than 400 impairments in the database, look-up tables are available that enable you to choose from a shorter list. Look-up tables allow the user to create groupings of impairments or sources in order to make data entry simpler. You can create custom groups for impairments that are common in your state. The ADB v.2 already contains some groupings of Impairments and Sources for your convenience, but we will make a new group now.

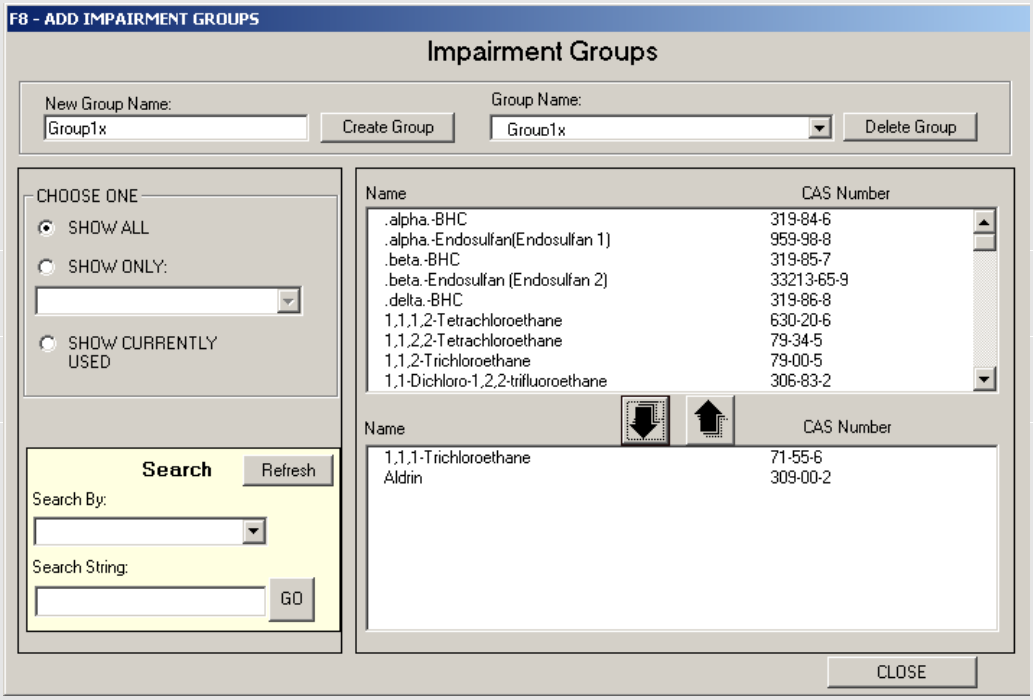
Making a Custom Impairment Group

1. On the menu toolbar, click on ***Modify->Look-up Groups->Impairment***

2. In the *Impairment Groups* screen, type **Group 1x*(****use the same letter you've been using for AU ID)*** in the *New Group Name* text box and click on **Create Group**. *Group 1x* will appear under the *Group Name* text box.

3. *Group 1x* will contain impairments that are of particular concern to public health officials. Click the *Show All* radio button and a list of impairments will appear under *Name*. Pick ***1,1,1-Trichloroethane*** and ***Aldrin*** and click the down arrow.

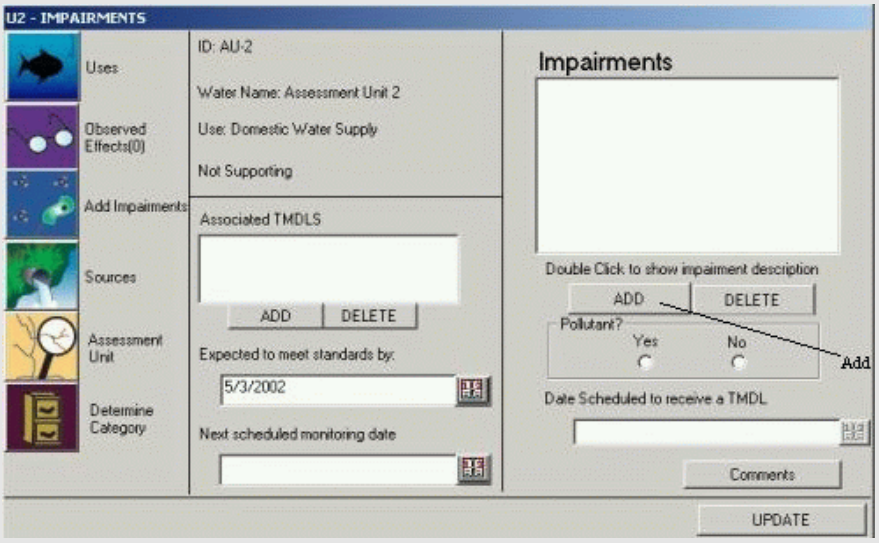
The down arrow will move the impairment to the box at the bottom of the screen, which displays the impairments that are in the group that you create.



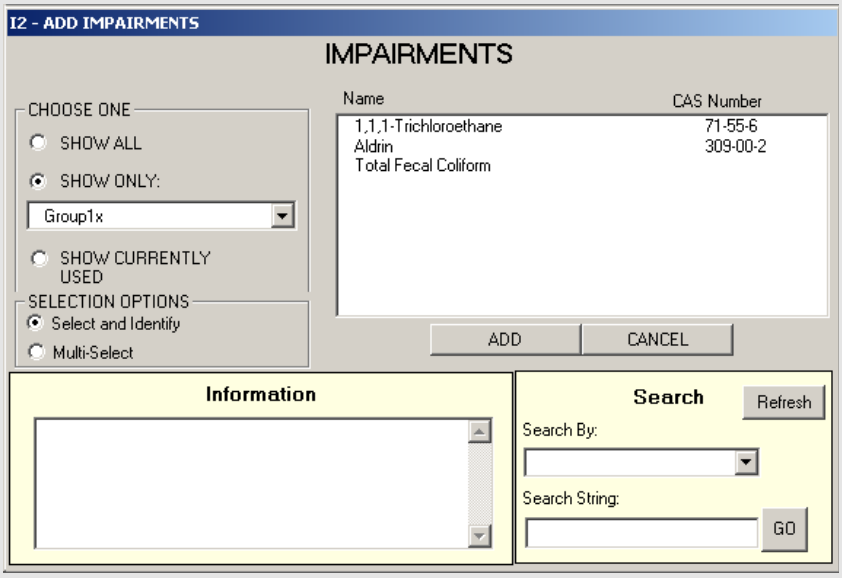
4. Click on the *Show Only* radio button and select ***Pathogens*** from the dropdown list. A list of pathogens will appear under *Name*.

5. Select ***Total Fecal Coliform*** and click the down arrow. Click **Close** at the bottom to close this dialog.

6. Under *Impairments*, click **Add** (the Add button on the right, as shown below)



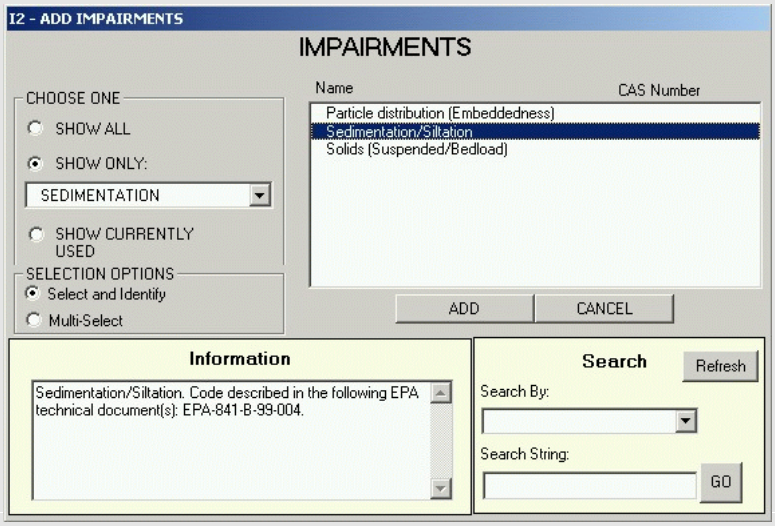
7. Click the *Show Only* radio button under *Choose One* and pick ***Group 1x*** from the dropdown list. The impairments that you added to the group will be on the right side under *Name*.



8. Select ***Total Fecal Coliform*** and click **Add**. Total Fecal Coliform will appear in the *Impairments* box.

9. Click the **Add** button under Impairments again (the one on the right) to add another impairment.

10. Click the *Show Only* radio button and select ***Sedimentation*** from the drop-down list. Select ***Sedimentation/Siltation*** under *Name* and click **Add**.



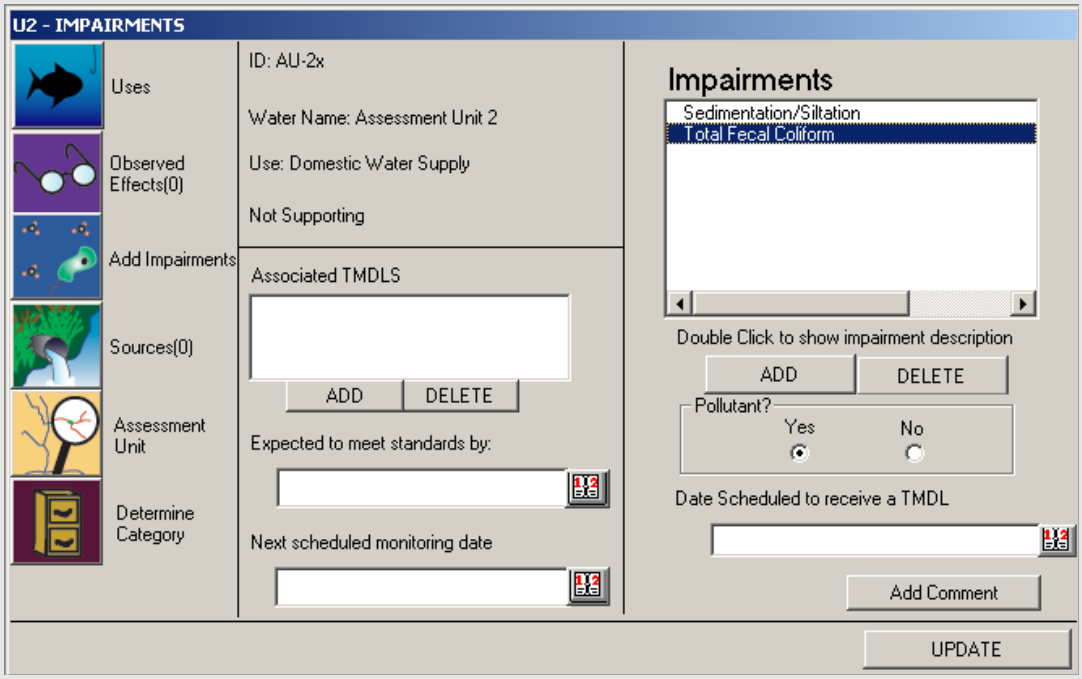
Pollutant vs. Non-pollutant

Every impairment can be flagged as either a pollutant or a non-pollutant. Whether or not a use is impaired by a pollutant can affect which Category an AU is in. By default, all impairments will be flagged as pollutants. You can change this default for impairments by clicking on the ***Modify*** menu, and selecting ***Pollutants/Non-pollutants***. If an impairment is defaulted as a non-pollutant, then every time that impairment is added to a use, the pollutant flag will be set to "no". Changing the default pollutant status of an impairment will not affect any impairments that have already been added to uses, and the pollutant flag can be changed at any time.

Entering Sources for Impairments

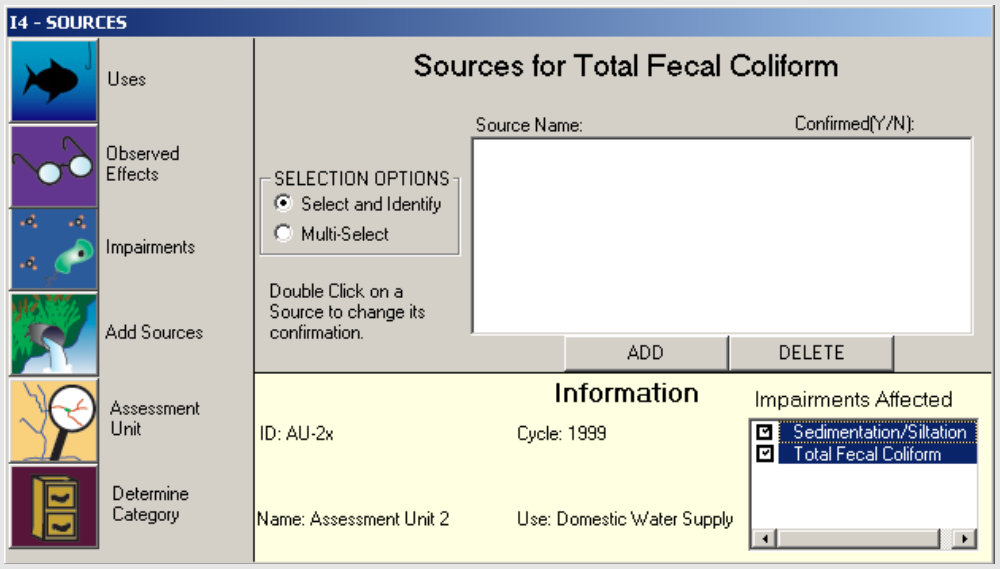
The ADB v.2 allows you to enter Sources for Impairments. A custom source group can be created in the same way you created an impairments group (***Modify->Look-up Groups->Source***). However, this time, we will use the groups provided with the ADB.

1. Select the *Total Fecal Coliform* impairment.



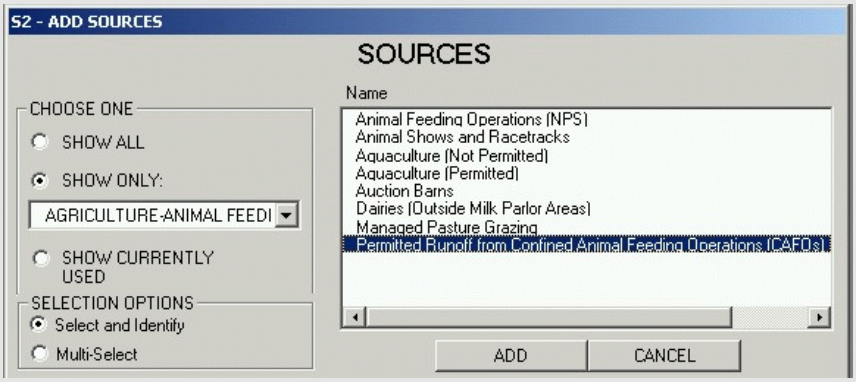
2. Click on the **Sources** button on the left side of the Impairments screen 

3. Under *Impairments Affected*, make sure the boxes for both of the Impairments are checked. (Use the shift key to check them both).

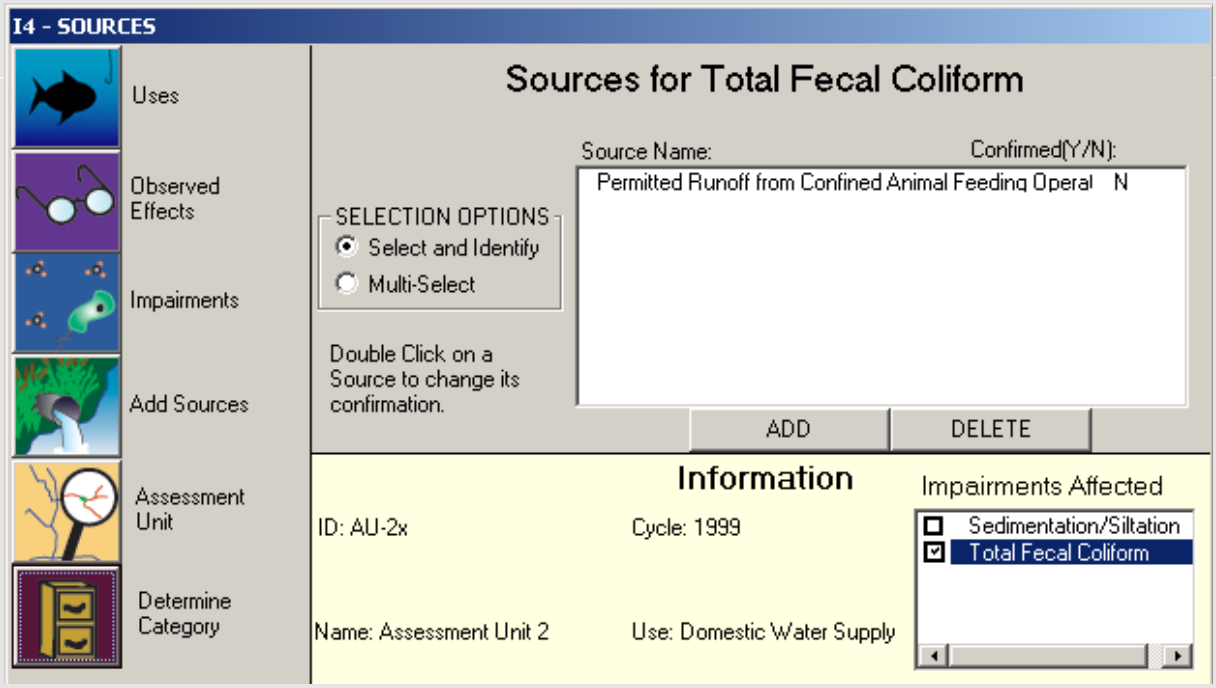


4. Click **Add**.

5. You can filter the *Source* list in the same way you filtered the *Impairments* list. Click on the *Show Only* radio button and choose ***Agriculture-Animal Feeding Operations*** from the drop-down list.

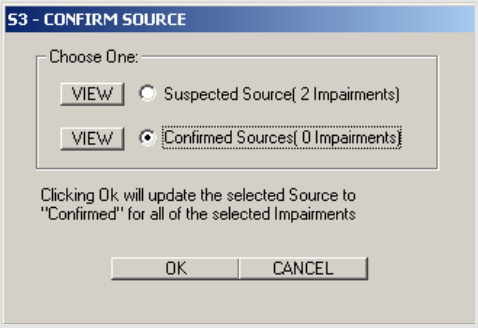


6. Click on ***Permitted Runoff from Confined Animal Feed Operations (CAFOs)*** and click **Add**. The source will appear in the text box for *Sources for Total Fecal Coliform*.



The "Confirmed" heading beside the source name defaults to Not Confirmed ("N"). This allows the user to enter a suspected source and confirm it later. A confirmation could be made after the development of a TMDL or after other information is obtained. However, it is not necessary to wait for the development of a TMDL if the information is already accurate enough to confirm the source.

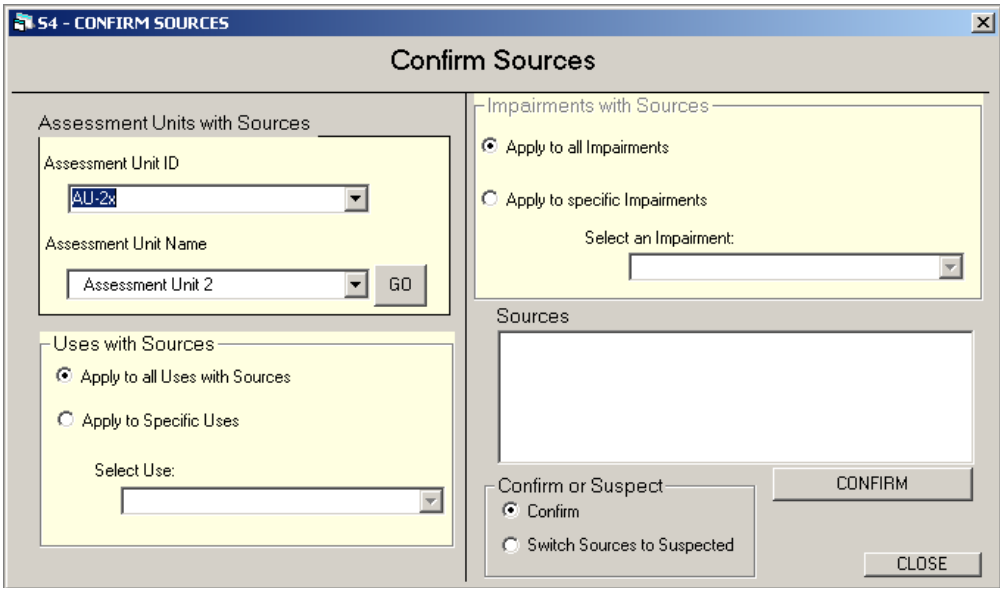
1. Double click on the source name to change its confirmation.



2. Click on the *Confirmed Sources* radio button and click **OK**. This will confirm the sources.

3. Click on the **Impairments** button to return to the Impairments screen.

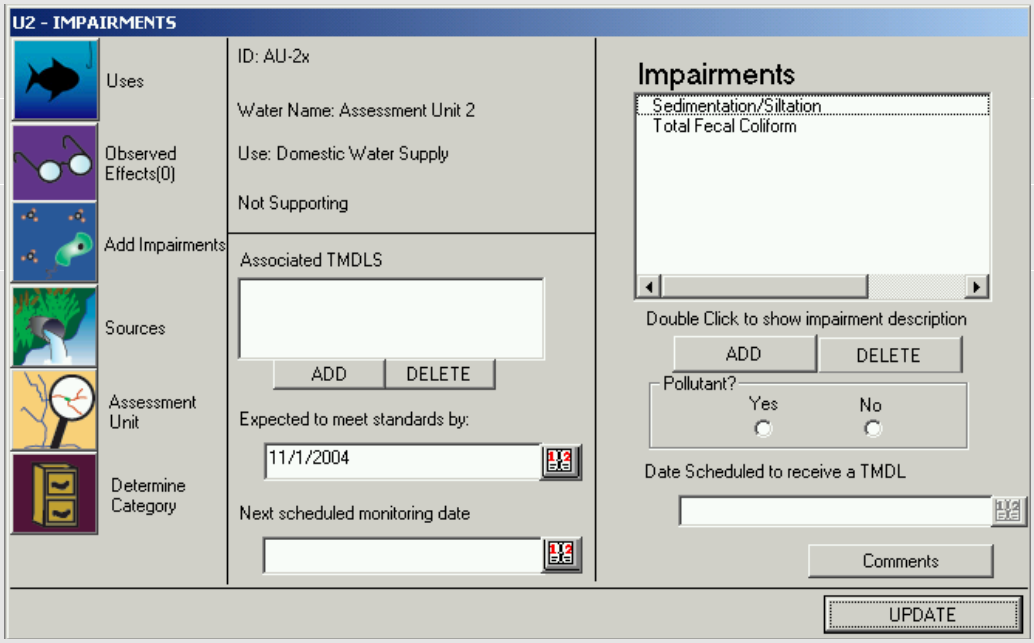
You can also confirm several sources at once by accessing ***Data->Confirm Sources*** from the Assessment Units screen.



In the Confirm Sources screen, you can work with a specific assessment unit, or you can confirm sources for a specific use or impairment or all uses and impairments.

Although this Assessment Unit is impaired, it is expected to meet its designated uses by the next reporting cycle.

1. In the *Expected to meet standards by*: box type ***11/1/2004.***



2. Click the **Update** button. When asked if you are sure, click **Yes**.

For Assessment Units that you have indicated a date in *Expected to meet standards by*:, you should also include an Implementation Requirement. We will do this through the Validation Module in Exercise 5.

Associating a TMDL with an Assessment Unit

You can associate TMDLs with the Impairments from the *Impairments* screen by clicking the **Add** button below the *Associated TMDLs* text box. When you click this button, you can select an existing TMDL in the database or enter a new one. Note that this TMDL is linked to the Assessment Unit, so you will see the same linked TMDLs in this dialog no matter which designated use you are entering an impairment for. You can also enter a date the AU is expected to meet attainment standards for its designated uses and enter the next scheduled monitoring

date.

You should note that the information entered on the main *Impairment* screen can influence what category an AU falls into. For example, if you determine that an impairment is not a pollutant, then that can change the AU to a Category 4C. If you associate a TMDL with the AU, then the AU becomes a category 4A. If you enter an "expected to attain date", then the AU becomes a Category 4B.

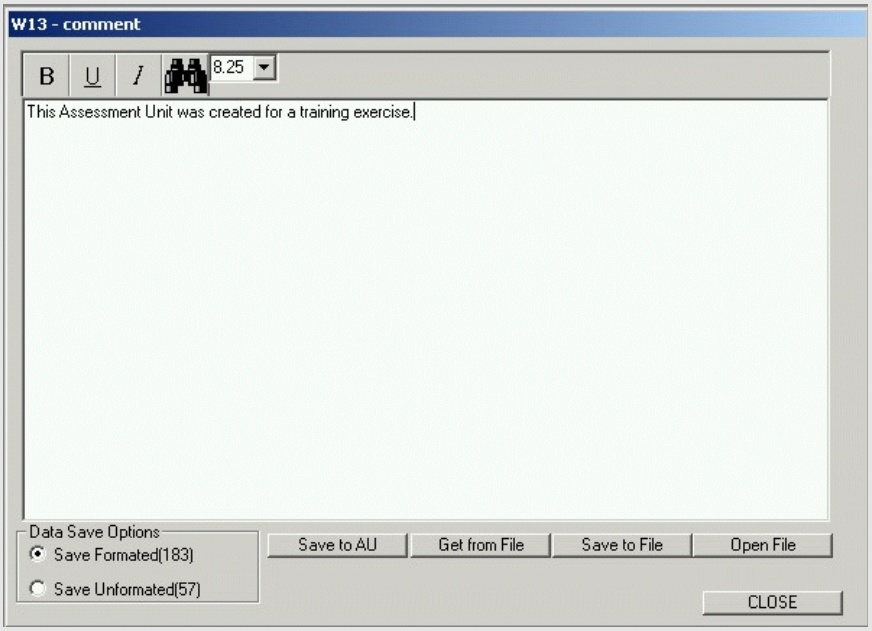
Adding Comments

ADB v.2 allows you to add comments to AUs using Rich Text Format (RTF). This means that you can create comments that are formatted for easy reading. You can add color, bullets, bolding, underlining, italicizing, and different fonts and font sizes.

1. Click on the **Assessments** button to return to the main *Assessment Units* screen (if you are not already there).

2. Click on the **Add Comment** button on the *Assessment Units* main screen. The comment editor will open.

3. Type the information below into the *Comment* dialog box and click **Save to AU**. Next click **CLOSE** to return to the main *Assessment Unit* screen.



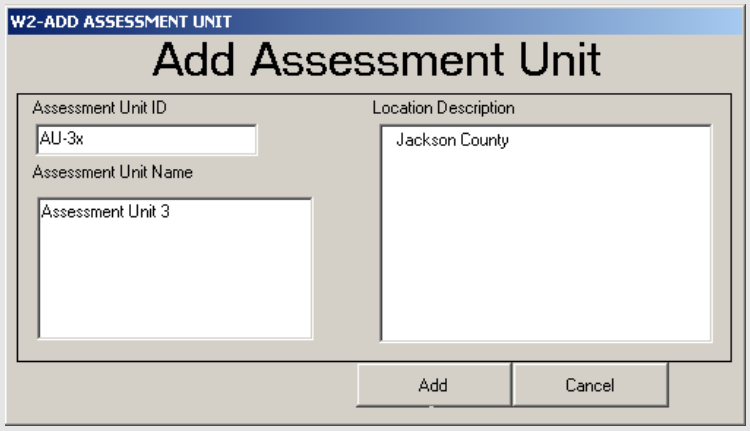
This information will now be associated with this Assessment Unit and can be accessed in the main *Assessment Unit* screen by searching for that Assessment Unit and clicking on **View Comment**.

Observed Effects

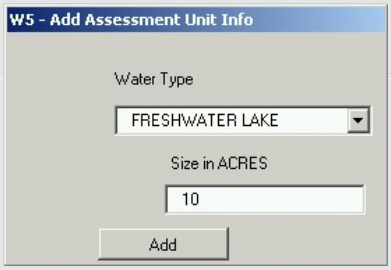
Observed Effects are monitoring observations that may indicate a decline in water quality, but which are not defined in the state water quality standards as an impairment. Observed Effects can be added to a designated use similarly to the ways impairments are added. However, observed effects can be added to uses that are 'Fully Supporting' and not threatened, whereas impairments can not. Secchi Depth measurements or fish kills might be examples of Observed Effects. The ADB v.2 does not allow anything in the impairment list to be used as both an Impairment and an Observed Effect in the same reporting cycle since Observed Effects are not specified in a state's Water Quality Standards. Before you can assign an impairment as an Observed Effect, you must specifically designate it as an Observed Effect.

1. Click on the **Add** button in the main *Assessment Units* screen to add a new Assessment Unit.

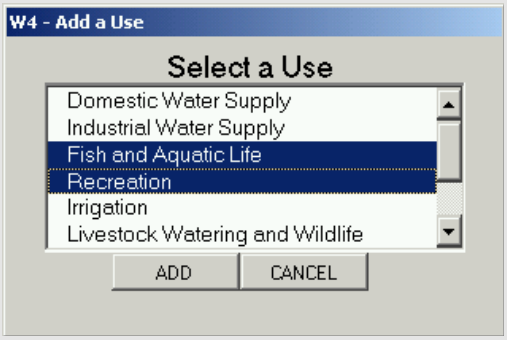
2. Fill in the following information in the *Add Assessment Unit* dialog box and click **Add**.



3. Fill in the following information in the *Add Assessment Unit Info* dialog box and click **Add**.

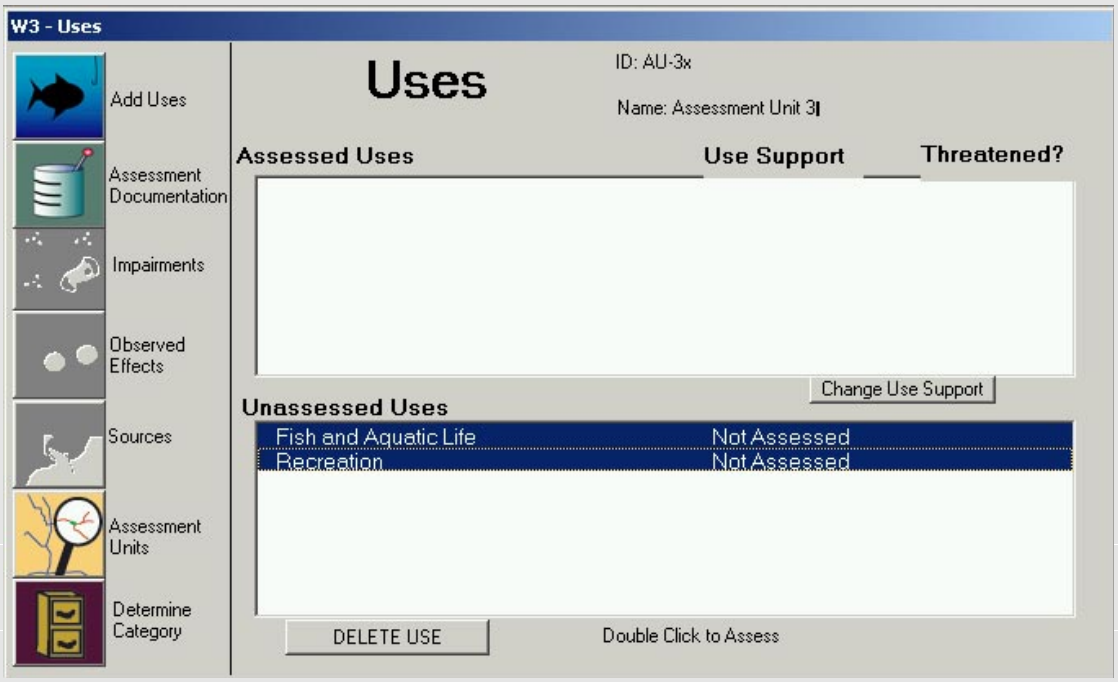


4. Click the **Add Uses** button and select ***Fish and Aquatic Life*** and ***Recreation*** in the *Select a Use* dialog box and click **Add**.



Instead of adding Assessment Metadata to the uses individually, this time we will add it to both uses at one time.

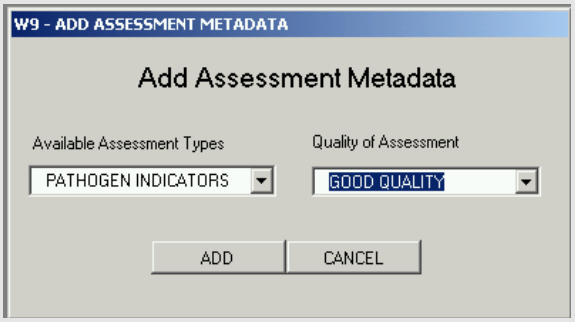
1. Use the **Shift** key to select both uses under *Unsassessed Uses* in the *Uses* dialog box.



2. Click on the **Assessment Documentation** button at the left. 

3. Under the *Use Support* drop-down box, pick ***Fully Supporting***

4. Fill out the following information for *Assessment Metadata* and click **Add**.



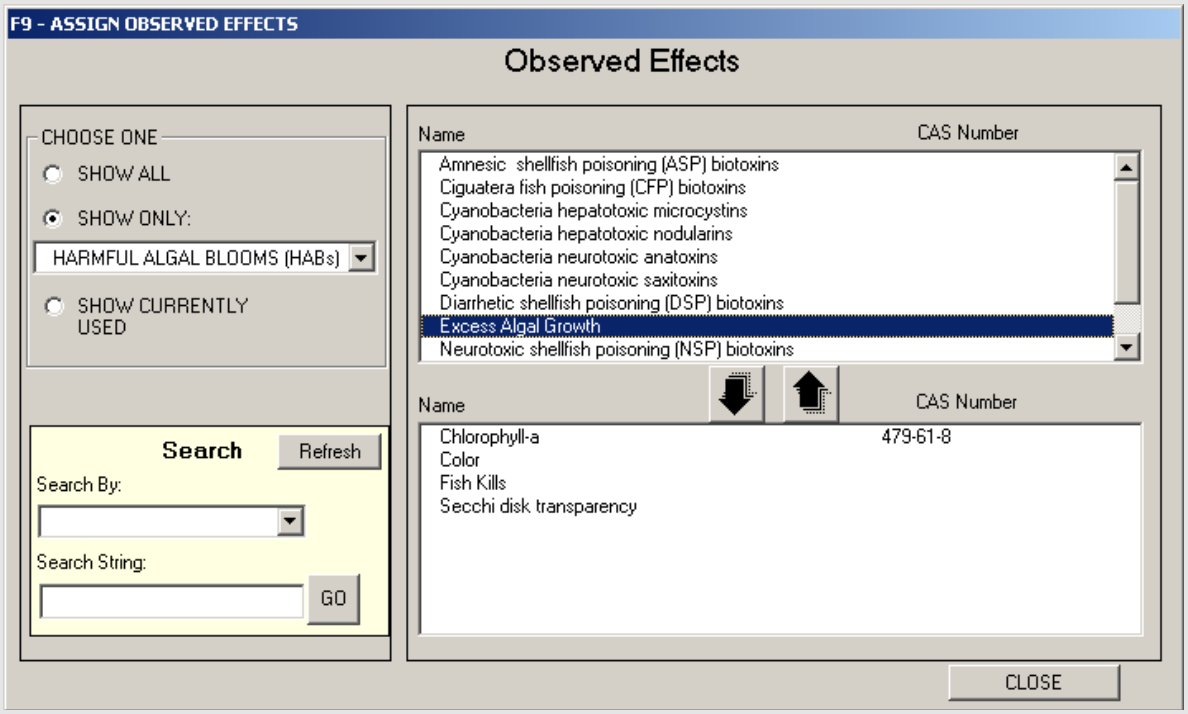
5. Next, click **Save** and click on the **Return to Uses** button 

In this example, there are signs of a nutrient problem in the lake (a nuisance algal growth). Which nutrient is causing the problem is unknown. However, it is suspected that it is phosphorous running off of a nearby field. Until further studies can be conducted, we might not want to label phosphorous as the nutrient of concern. Instead, we could enter 'algal growth' as an observed effect. Then, we could include a comment noting that phosphorous is the suspected impairment but that additional investigation should be performed.

Before we add any Observed Effects to this Assessment Unit, first we have to differentiate them from Impairments. You can create a look-up group that has the Observed Effects that you want to use for that reporting cycle in a way similar to how we created lookup groups for Impairments.

1. On the menu toolbar, choose ***Modify->Observed Effects***.

2. Click the *Show Only* radio button and pick ***Harmful Algal Blooms*** from the drop-down list. Pick ***Excess Algal Growth*** from the *Name* list. (If you are attending a class that accesses the ADB v.2 from a network, steps 2 & 3 may already be done.)



3. Click the "down arrow" to move the item to the Observed Effects Group and click **CLOSE**.

4. From the *Uses* screen, click the **Observed Effects** button 

5. In the *Observed Effects* dialog box, click **Add.** The Observed Effects that are currently being used will be shown by default.

6. Click the *Show All* radio button and select ***Excess Algal Growth.*** Click **Add**. The observed effect appears in the *Observed Effects* dialog box.

7. Click the **Assessment Unit** button to return to the main *Assessment Units* screen.

8. Click the **Add Comment** button and then click the **Get From File** button.

9. Navigate to the ***comment.rtf file*** in your ***ADB_sampledata*** folder. Click **Open**.
   The bold and italics in the comment will be preserved when the file is imported to the database.

10. Click **Save to AU** and then **CLOSE**.

11. **Close** the Assessment Database.

Adding Files to Assessment Units

The ADB v.2 also allows you to associate graphics or other types of files with an AU. You can add a jpeg showing a picture of the site where the assessment was performed or a lengthy document describing the AU. To associate a document with an AU, just click on **Add File** on the *Assessment Units* screen. There is no limit to the number of documents you can add to an AU. Keep in mind, however, that Oracle may not be the most efficient way to store a large number of documents. It may be more efficient for you to store documents on an NT server, rather than in your database.

Summary

In this exercise you learned how to add impairments and observed effects that are associated with the designated uses for your AUs. You also learned how to modify the many look up tables in the ADB to help simplify data entry, like creating impairment groups and setting the default values for pollutants vs. non-pollutants.

In the next exercise, you will learn about the Connections Module and how to use it to connect to data in tables outside of the ADB v.2.

Exercise 4. Using the Connections Module

The ADB v.2 comes with two additional applications: a Data Validation Module and a Connections Module. This exercise will focus on the Connections Module. The Connections Module is designed to help you work with your data outside of the ADB v.2 environment and it will also allow you to work with data in other databases. The Connections Module allows the user to have direct access to the ORACLE database and view the data in the ADB in table format. These tables can also be exported for analysis outside of the ADB. It also allows the user to link to tables in other databases (i.e. ORACLE, Access, SQL Server, or any ODBC compliant database), which enables them to be viewed in the ADB. For example, this connection could be useful if you want to store information such as the sub-basin an assessment unit is in. Any data accessed through the Connections module will not be included in the electronic submission to EPA. This feature is solely for the convenience of the ADB v.2 users.

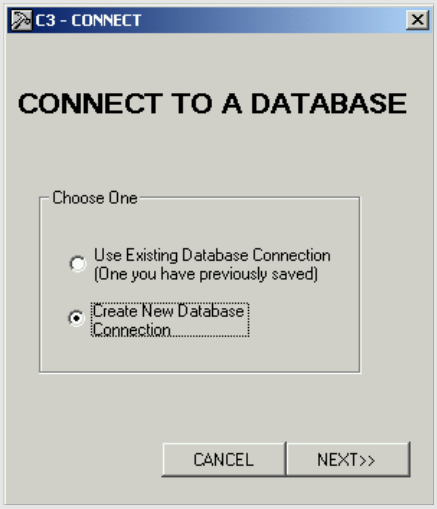
In this exercise, you will learn how to connect to an Access database to bring a table into the ADB v.2. You will also learn how to connect to the ADB data tables and, using custom queries, create tables that can be exported into a comma-delimited text file which then can be used to limit the Assessment Units that can be viewed in the database.

Creating a New Database Connection

The Access database we'll be using contains some assessment information that was collected in the field. It is stored in a single table called *AU_HUC* in the Access data file.

1.	Open the Connections clicking on ***Start->Programs->ADB v2->Connections*.**
	An interface with a *Tables* tab and a *View* tab will appear.
2.	From the ***File*** menu, select ***Connect to Database***.

3. In the *Connections* dialog box, click on the *Create New Connections* radio button and click **Next**.



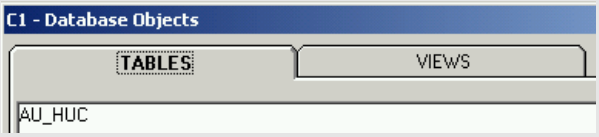
4. From the *Connections Type* dialog box, select ***Microsoft Access*** and click **Next**.

5. In the *Connect to Access* dialog box, click on the Navigation button ... and navigate to the **TN_location.mdb** database in your **ADB_sampledata** folder.
Click **Open**.

6. Next, check the *Save Connection on Finish* check box. This will allow you to use the same connection later after you close the ADB.

7. Click **Test Connection**. This will let you know if the database connection is working properly. You should get a message saying ***Test Successful***. Click **OK,** then click **Finish** in the *Connect to Access* dialog box.

8. You will be prompted to name your database connection. Call it **TN_Location**. Click **OK**. The *AU_HUC* table will appear in the *Tables* tab.



9. Select the *AU_HUC* table, then right click on it. Choose ***Open***. The AU_HUC table will open.

In this example, the AU_HUC table contains information about assessment units which includes state watershed and sub-basin, as well as county FIPS code and Lat/Long coordinates. Although these data cannot be stored in the ADB v.2, it is easy to connect to a table in which these data are stored and update the data while you work in the ADB v.2. There are a variety of functions you can use to work with this table that are accessible by making a column active and right-clicking on it:

-Sort Ascending/Descending
-Copy/Paste
-Filter
-Find
-Export Data

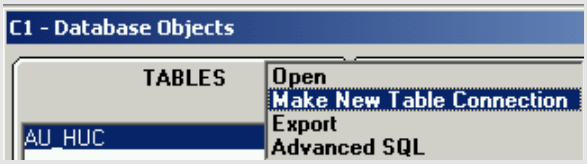
1. Make the *Subbasin* column active by clicking on the column heading. Next, right-click on it.

2. Click the **Sort Ascending** button. The records in the table get sorted based on the *Subbasin* column.

3. Close the table by clicking the X in the upper right corner.

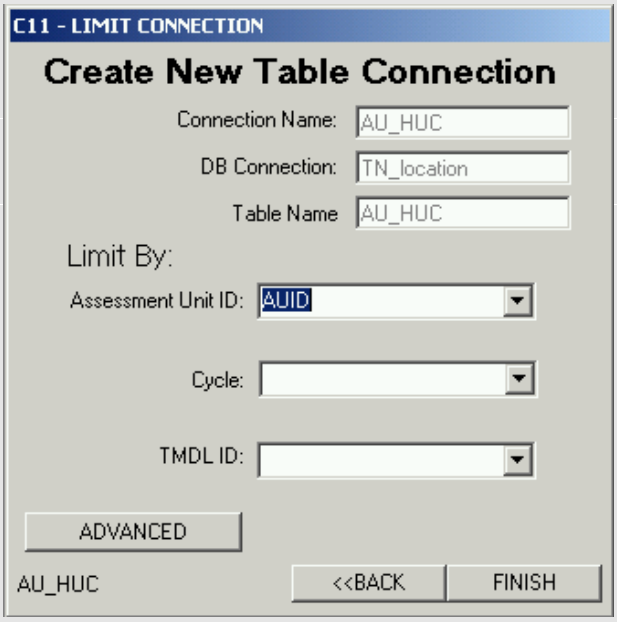
Now that we have created a database connection, we need to make a connection between the table in the database and the ADB and tell the ADB v.2 how the fields in the *AU_HUC* table relate to the AUs. In this case, the *AUID* field in the table corresponds to *Assessment Unit ID* in the database.

1. Make the *AU_HUC* table active by selecting it with your mouse. Right click on the word *AU_HUC* in the ***Tables*** tab. Click on **Make New Table Connection.**



2. Name the connection **AU_HUC** and click **Next**.

3. In the *Limit Connection Screen*, pick ***AUID*** from the drop-down list beside *Limit By: Assessment Unit ID* and click **Finish**.



4. When prompted, make sure the table connection is still called *AU_HUC* and click **OK**.

5. Close the Connections Module by clicking the **X** in the upper right corner.

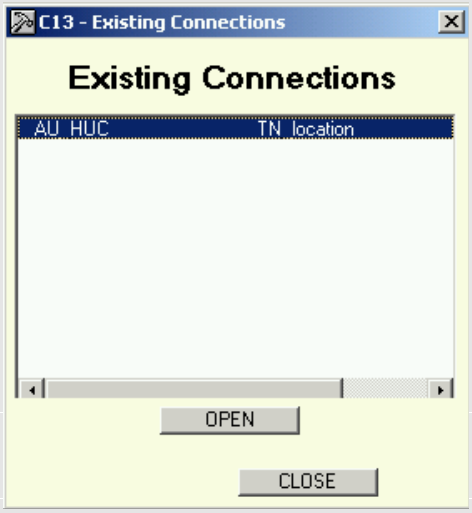
The "Limit By:" dialog defines the relationship between the AU_HUC table and the

Assessment Database. You can further limit the records your table displays if the table has a Cycle field or a TMDL ID field. Relating the Cycle field in your table to the Cycle in the database will only show records for the current cycle in the database. Limiting the records by TMDL ID functions in the same way.

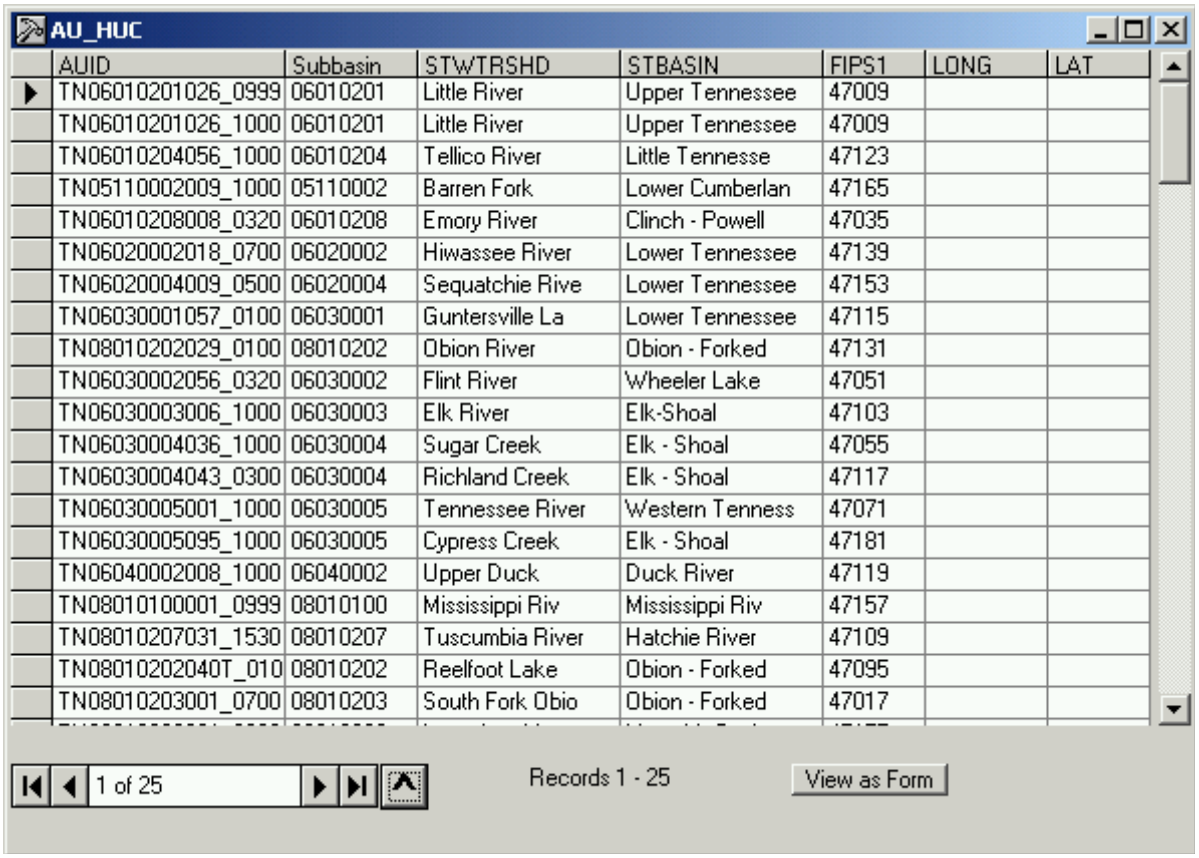
Updating the table in the ADB

1. Open the ADB by going to the ***Start*** menu and clicking on ***Programs->ADB v.2->ADB v.2.*** Click on the **Assessments** button from the main database menu.

2. From the ***View*** menu, choose ***Show Connections***. From the *Existing Connections* box, select the ***AU_HUC*** entry and click **Open**.



3. Click **Yes** when you are asked if you want to enforce limits for the connection.



You can resize the table so you can see both the table and the ADB. screen. If you click on the ADB screen it will appear on top of the *AU_HUC* table, so after you resize the box, drag it to either the top or the bottom so that you can make it active from the ADB screen. (As long as a part of the table is visible, you can click on it to make it active).

You can also view the records using a form by clicking on the **View as Form** button. If the View as Form button disappears as a result of resizing the table, close the table and reopen it by going to *View->Show Connections* and picking the table.

One advantage of connecting to the table is that you can enter information into it at the same time as you enter the assessment unit data into the database. You could also connect to a table that has assessment information collected from the field to enter data about the assessment units into the database.

1. Click in the empty row at the bottom of the AU_HUC table. (If there is no empty row, click on the " * " to create a new row.

2. Enter **AU-2x** for the AUID and enter the rest of the information according to the following example:

	TN08010210002_0999	08010210	Wolf River	Memphis Basin	47157		
	TN0801021100720_09	08010211	Nonconnah Creek	Memphis Basin	47157		
	TN06030001057_0811	06030001	Guntersville La	Lower Tennessee	47115		
	TN05130101015_0799	05130101	Clear Fork	Upper Cumberlan	47025		
*	AU-2x	05130106	Cumberland	uppercumb	47133	-85.42	36.31

3. Click on any record above the one you just added to enter the data into the table for AU-2x.

The table has now been updated with data for AU-2x. This record will be present not only when the table is connected to the ADB v.2, but also in the Access database that we connected to (TN_location.mdb).

1. In the main *Assessments* screen of the ADB, select ***AU-2x*** from the *Search by ID* drop-down list.

2. Make the *AU_HUC* table active and drag it to where you can see the entire table. Notice that specifying an Assessment Unit in the ADB has limited the records in the table to the one associated with the Assessment Unit that you picked.

3. Close the *AU_HUC* table.

Exporting Data

Another feature of the Connections Module allows you to export data from the ADB to Access 97, Access 2000, and SQL Server. You can also choose to export the data as a comma-delimited text file (*.csv), which is illustrated in the following example.

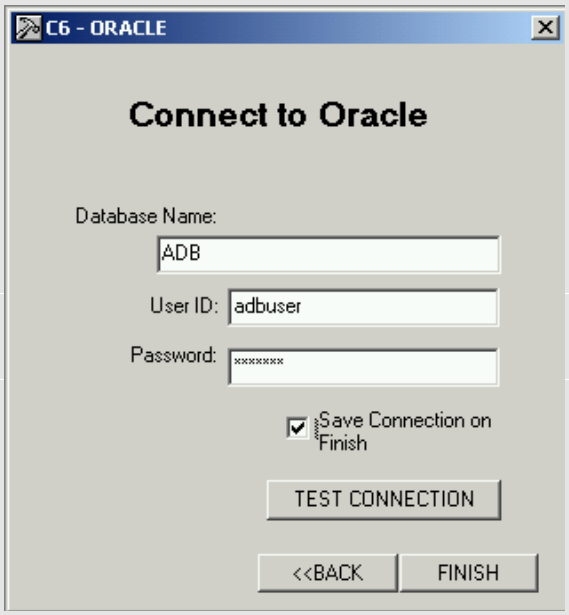
For this example, let's say that a water quality manager asks a question:

Q: *Which Assessment Units that have the Fish and Aquatic designated use are on the Category 5 list for impairments from Iron?*

1. Return to the Connections module by clicking the hammer icon at the top of your screen or access it through ***Start->Programs->ADBv.2->Connections***.

2. Choose ***File->Connect to Database.*** Click on ***Create New Connection*** and click **Next**. Choose ***ORACLE*** and click **Next**.

3. Enter the following information:



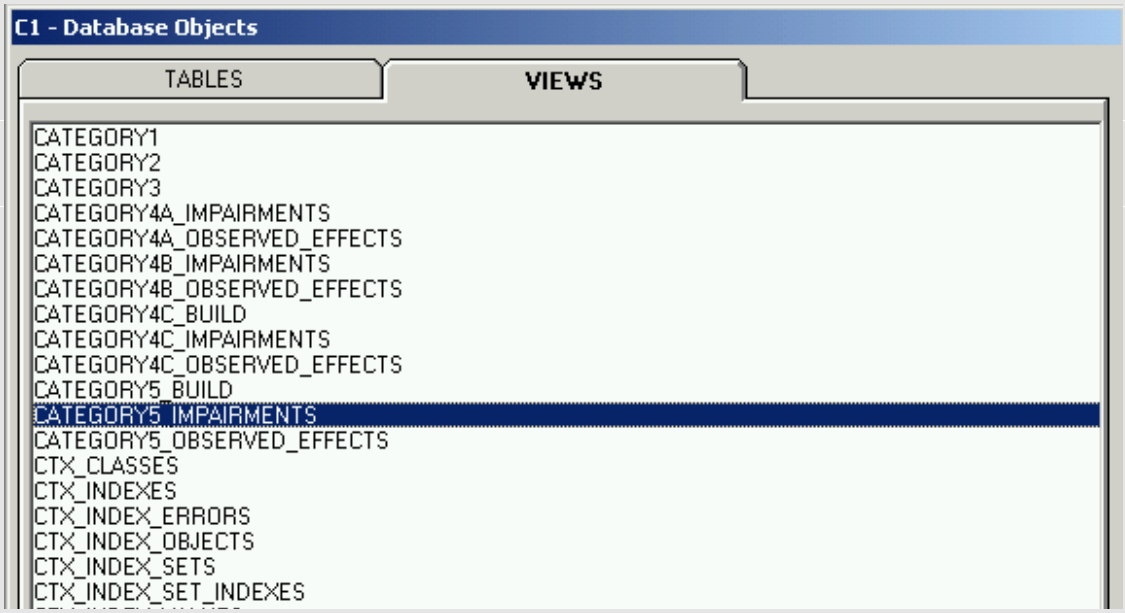
4. Check the box for Save Connection on Finish. This will allow you to use the same connection later after you close the ADB.

5. Click **Test Connection** (should say ***Test Successful***; click **OK**) and then click **Finish**.

6. Name the connection **ADB**. Click **OK**.

From this point forward, this connection will be available through the ***Existing Connections*** option and you will only need to enter the password to access it.

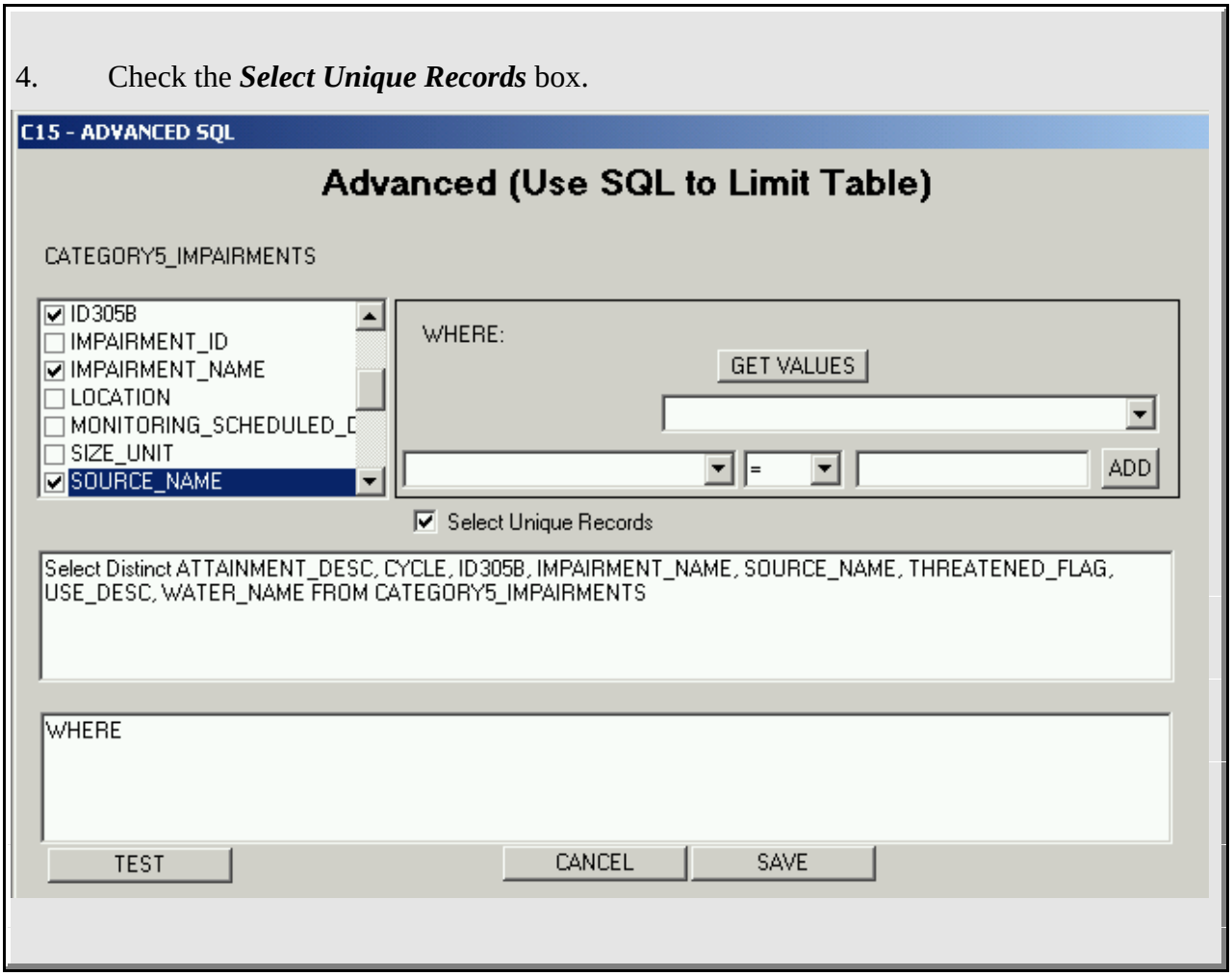
1. Click on the *Views* tab and select the ***Category5_Impairments*** table



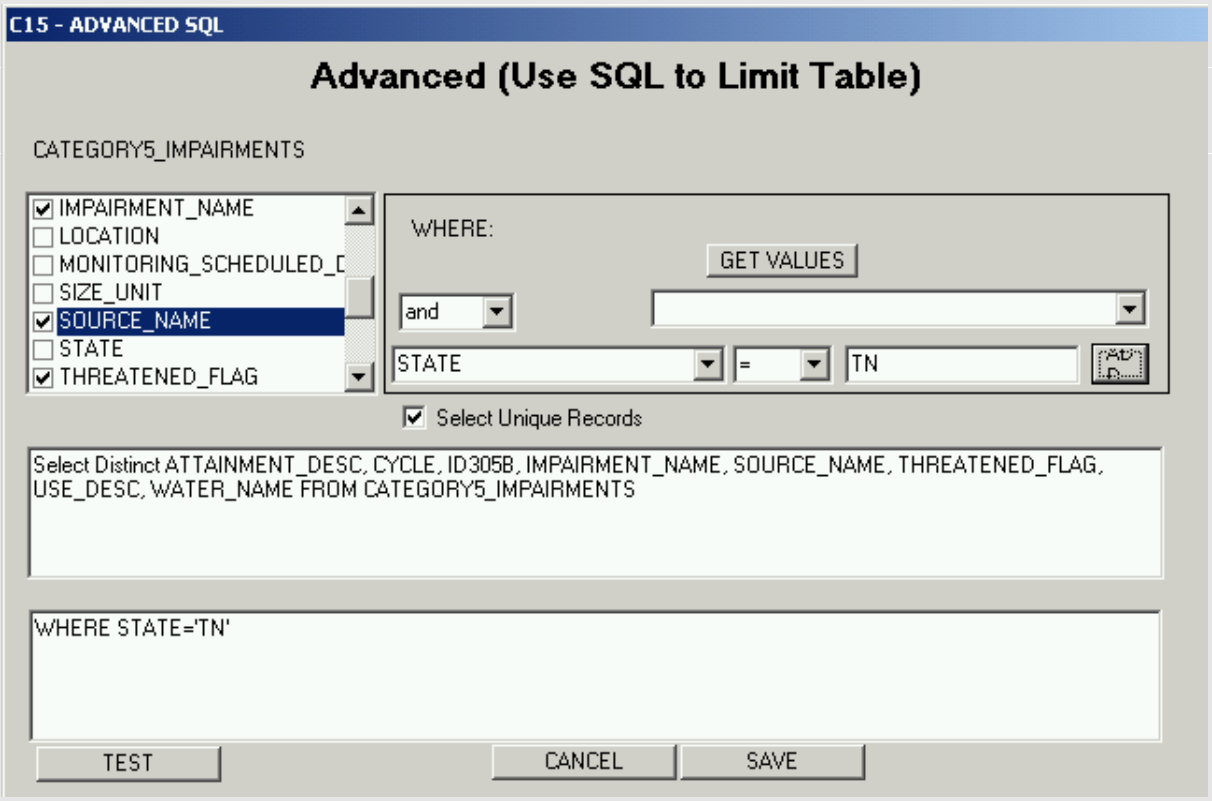
2. From the *Connections* menu, select ***Advanced SQL.*** The Advanced SQL dialog box allows you to create a custom query.

3. Check the boxes beside:
   - *ID305B*
   - *CYCLE*
   - *WATER_NAME*
   - *USE_DESC*
   - *ATTAINMENT_DESC*
   - *THREATENED_FLAG*
   - *IMPAIRMENT_NAME*
   - *SOURCE_NAME*

4. Check the ***Select Unique Records*** box.

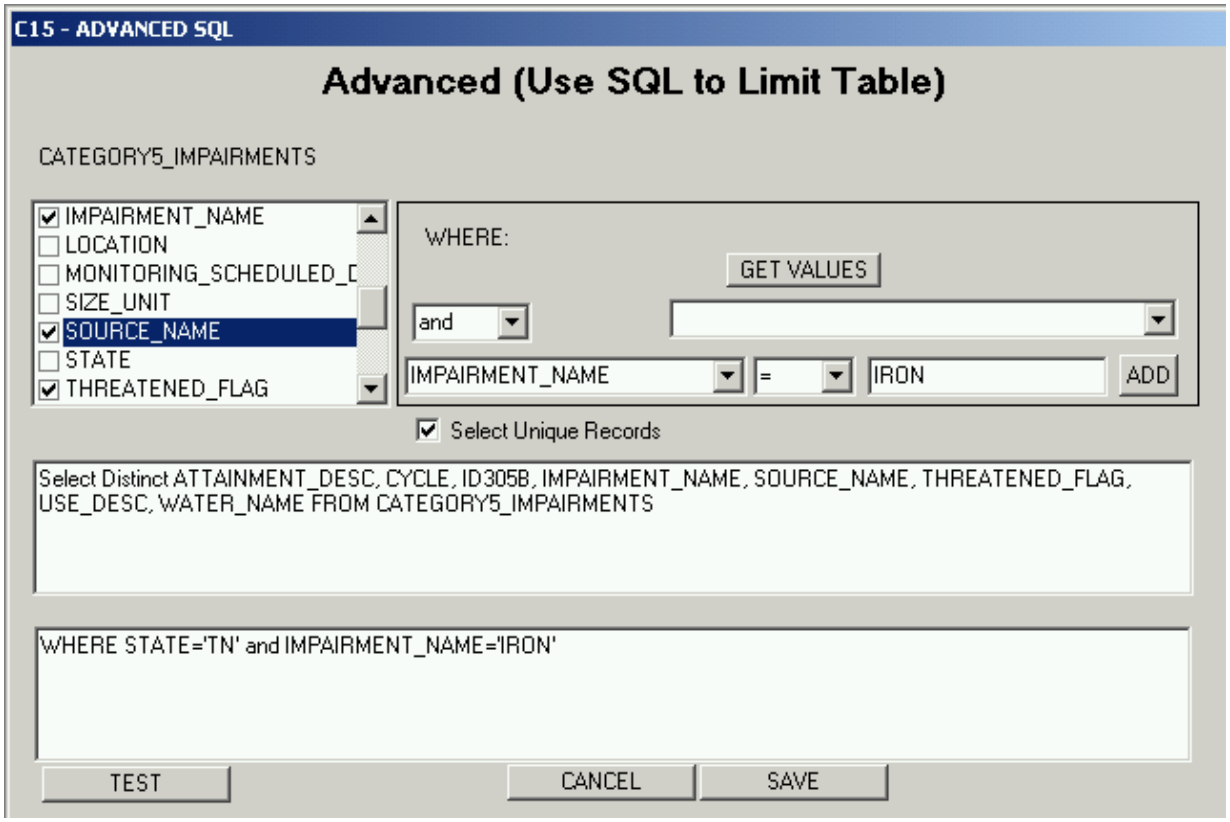


5. Under *Where:* select ***STATE*** from the dropdown list and enter ***TN*** in the box to the right of the "=" sign and click the **ADD** button.



6. Under *Where*: Select ***IMPAIRMENT_NAME*** from the dropdown list and enter ***Iron*** in the box to the right of the "=" sign and click the **ADD** button.

*NOTE: instead of entering values at the right of the "=" sign, you may use the **GET VALUES** button to use a dropdown list that you may choose values from. This may be slow however.)*



The graphic above shows the SQL statement that you created. This statement will retrieve from the database all the Assessment Units in the Category5_Impairments that are in Tennessee and are impaired by Iron. You will be able to recall this SQL string at any time in the future. Since it is a live connection to the database, as you update the database, these query results will be updated as well.

1. Click the **TEST** button. This will show you what the table will look like. (You may have to scroll to the right to see all the fields.) Note that there is data from both cycles(1999, 2000) in the table. Also note that although this is a table of Category 5 Impairments, one of the Assessment Units is "Fully Supporting". This is because the "Y" in the *Threatened_ Flag* field indicates it is *Threatened*, which puts it in Category 5. Close the table.

2. Click the **SAVE** button. Save the query as ***IronFilter*** and click **OK**.

3. From the ***Connections*** menu choose ***View Saved SQL Scripts.*** (This table can be accessed this way at any point in the future.) Double-click on *IronFilter*.

4. The table you just created will open. Select one of the cells with *Fish and Aquatic Life* under the *USE_DESC* field. Right click on the cell and pick ***Filter***. This will retain only records with the Fish and Aquatic Life use.

5. Right-click on the same cell and pick ***Export Data***. Choose the ***Export as Filtered*** option.

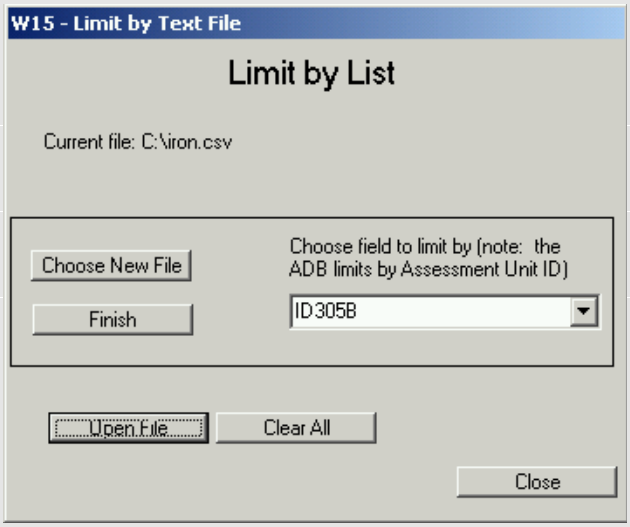
6. Save the file in the *ADB_Sampledata* folder as ***Iron.csv.***

The text file you created above can be used to limit which Assessment Units can be accessed in the main Assessment Units screen.

1. Return to the main Assessment Units screen in the ADB v.2. (If the database is not already open, you can access it through the Start menu.)

2. In the Search section of the screen, pick ***Limit by Text File*** from the *Limit List By:* dropdown list.

3. In the ***Limit List by*** dialog box, click the **Choose New File** button. Navigate to the ***Iron.csv*** file in your *ADB_Sampledata* folder and click **Open**.



4. Pick ***ID305B*** from the ***Choose field to limit by*** dropdown list. This relates the field that contains the ID in the table to the Assessment Unit ID in the ADB v.2. The Limit by function will only work with lists that have 1,000 IDs or less. Click **Finish.**

5. Click on the Search by ID dropdown list.

You can see that of the records that were in the table, only two are present in this list. These are the two records associated with the 1999 cycle.

➢ **Close** the Assessment Units screen.

Summary

In this exercise, you learned how to connect to an outside database and bring a table from that database into the ADB v.2. You also learned how to sort records in that table and add data to it. Finally, you learned how to export data from the ADB and how to limit records in the Assessment Unit screen by that data that you exported.

Next, you will learn about the Validation Module and how to use it to check data that has been entered into the database.

Exercise 5. Running the Validation Module

In this exercise, you will learn about the features of the validation module and how to use it to check the data you've entered in the database for completeness.

Overview

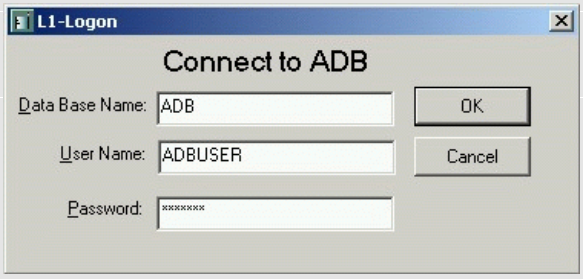
The data validation module serves three purposes:

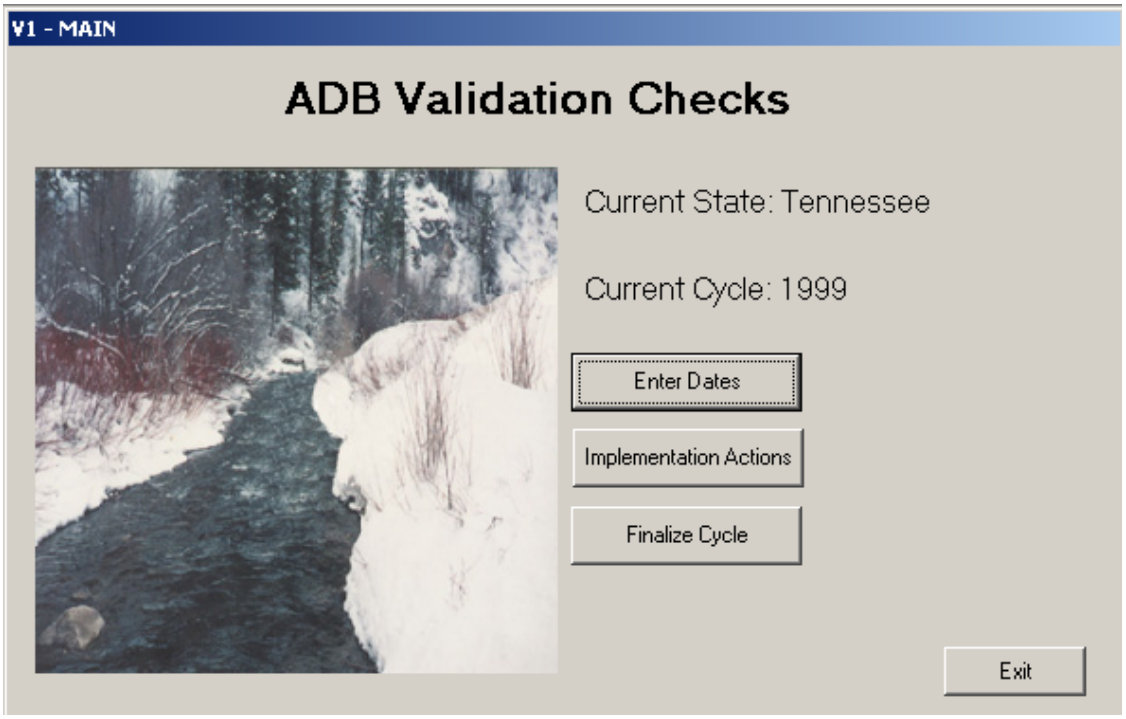
1) To ensure that all dates were entered properly

2) To add Implementation Actions to AUs that are expected to attain their standards

3) To run any final validation checks on the data to ensure that all of the required data have been entered

1.	Click on the Data Validation Module button at the top of the screen 
2.	Enter **ADB** for the database name, **ADBUSER** for the user name, and password (or the ID and password from your database administrator) and click **OK**.





Finalize Cycle

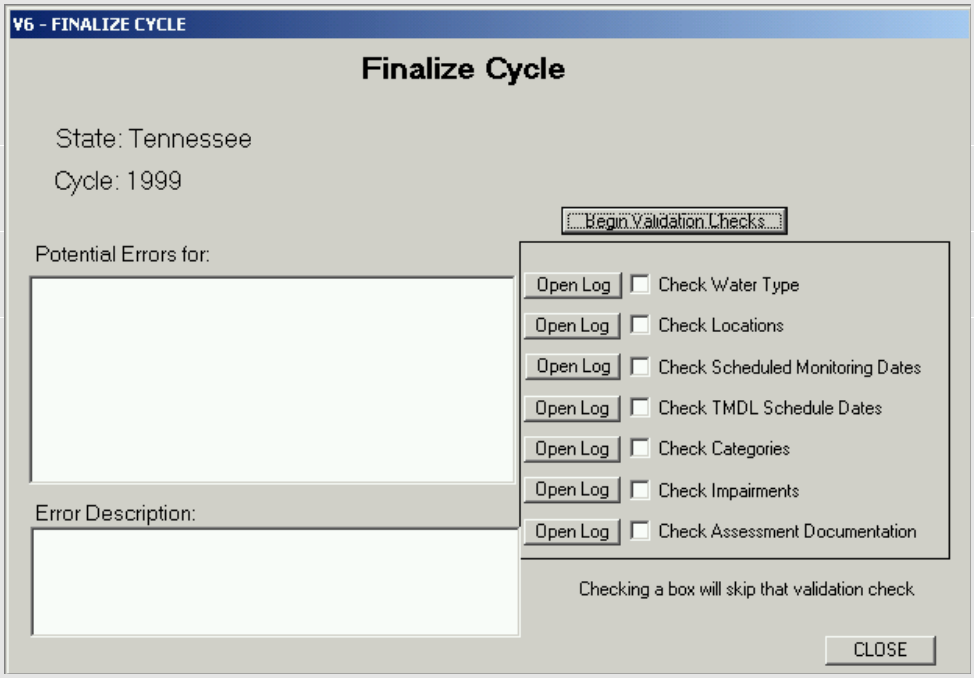
When you finish a reporting cycle, the *Finalize Cycle* feature can help you make sure that your data has all of the necessary components. *Finalize Cycle* feature will create log files of all the errors that it found during the check. The log files will be saved in comma delimited text file (.csv) format, which can be opened with a number of different software programs, including Excel. These log files can also be viewed by opening them in the *Finalize Cycle* dialog. The log files will give you a listing of all of the AUs that may have problems that need to be fixed.

1. In the main *ADB Validation Checks* screen, click the **Finalize Cycle** button.

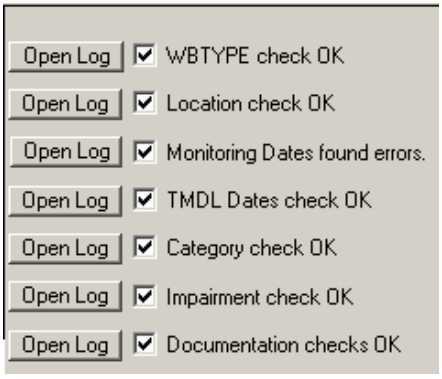
In the next dialog box, you can specify which validations you want the module to skip by checking their boxes. We are going to perform all of the validations, so don't check any of the boxes.

2. Click on the **Begin Validation Checks** button

3. You will be prompted to pick a place to store the log file that the validation module will create. Click **OK**, then navigate to your ***ADB_sampledata*** directory and click **Save**.



The validation module will start working. There is a status bar at the top of the screen that will indicate the progress of the check. Also, the text beside the check boxes will change as it completes these checks, indicating whether there is a problem or not. After it is complete, all the boxes that you decided not to skip in the *Finalize Cycle* dialog box should be checked. All of the validations indicate the check is OK except for the *Schedule Monitoring Dates*.



1. Click on the **Open Log** button beside ***Monitoring Dates check found errors***.

The information that appears in the *Potential Errors* text box indicates that AU-2x is missing information.

2. Double click on the AU ID in the ***Potential Error*** box to get an error description.

According to the error, there needs to be a monitoring date scheduled for AU-2x since it has been assigned a date by which it is expected to attain its water quality. We will fix this with the Validation Module's *Enter Dates* feature.

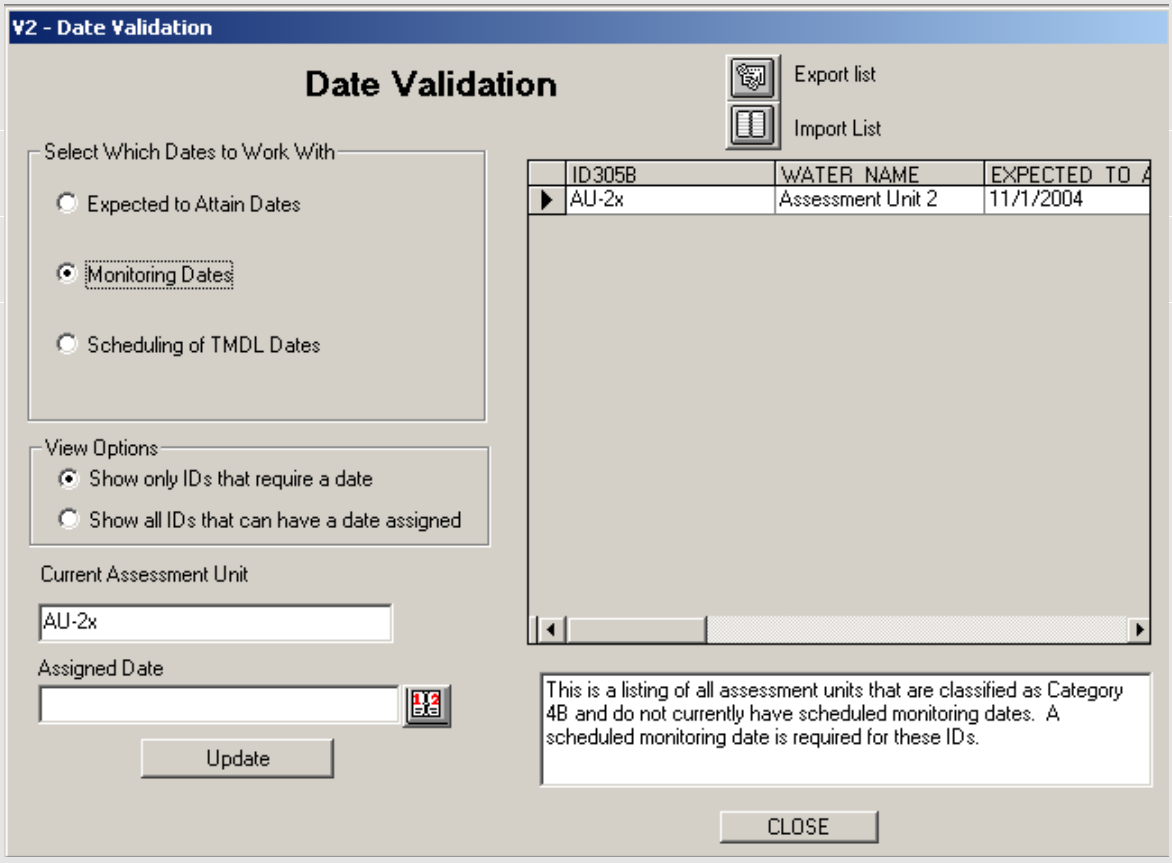
1. Click **Close** on the lower right corner of the dialog box. This will return you to the main *ADB Validation Checks* dialog box.

Entering Dates with the Validation Module

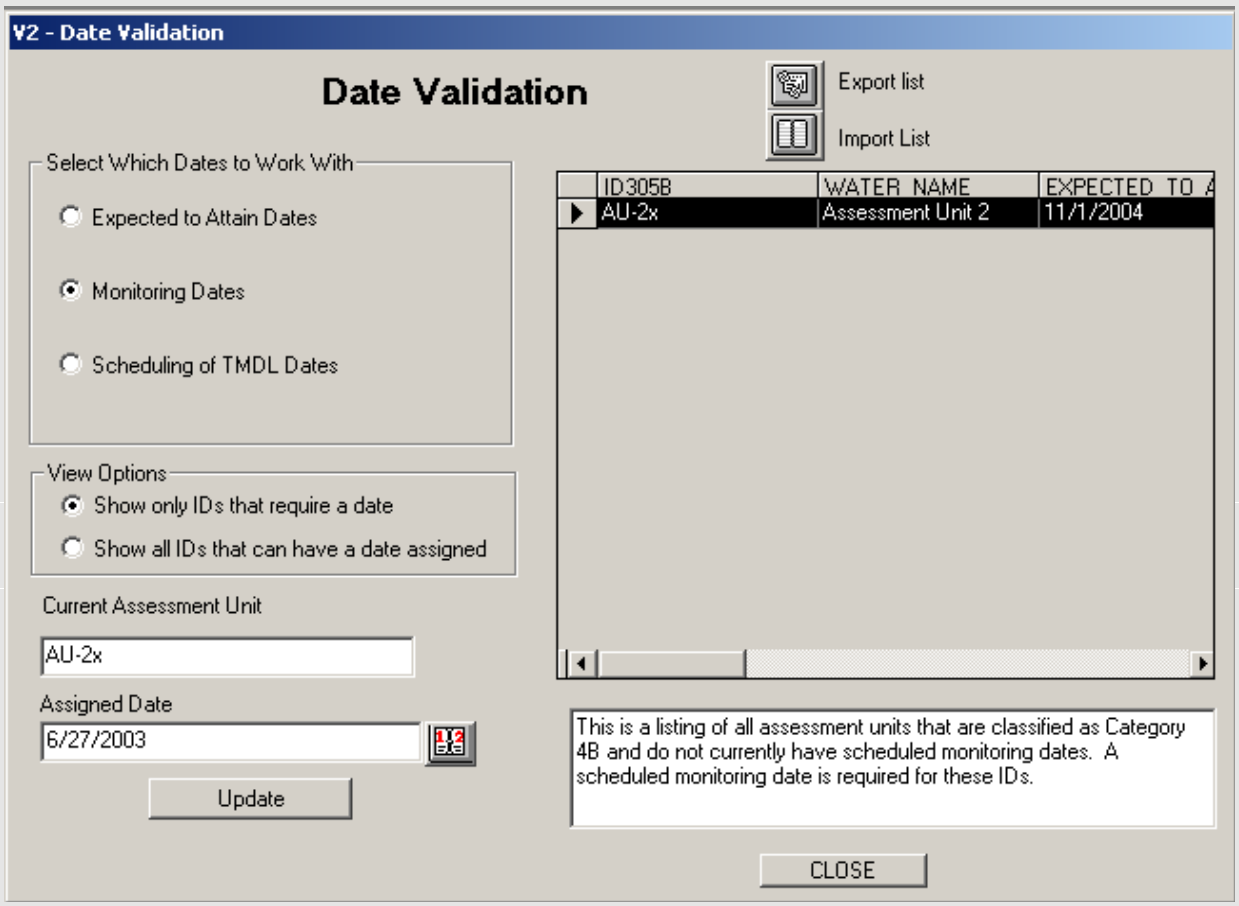
It is understood that the person entering the assessment data in the ADB may not be the same person who determines the crucial dates (i.e. Date scheduled to receive a TMDL) for the AUs. The *Enter Dates* feature in the *Validation Module* allows you to export a list of all of the items that require a date to a comma delimited text file (*.csv) that can be opened using Excel. This file can be sent to the person responsible for these crucial dates. That person can then fill in the dates and return the file to the person responsible for the ADB. The validation module will allow you to import this file and it will update all of the crucial dates for you. In this example, we will enter the Scheduled Monitoring Date without exporting a table.

1. Click on the **Enter Dates** button in the main *ADB Validation Checks* dialog box.

2. Under the *Select Which Dates to Work With* section, click the radio button for **Monitoring Dates.** Under the *View Options* section, click on the **Show Only IDs that require a date** radio button.



3. **S**elect the record in the table. Under *Assigned Date*, click the calendar button and pick **June 27, 2003.** Click the **Update** button. Notice that when you update a record, the record disappears in the table.



4. Click **CLOSE**. This will return you to the main *ADB Validation Checks* screen.

5. Click the **Finalize Cycle** button. Check all of the boxes ***except*** the ***Check Monitoring Dates check*** box and click the **Begin Validation Checks** button. Save the log file in your ADB_Sampledata folder.

   The Validation Module indicates the Monitoring Dates are OK.

6. **Close** the Finalize Cycle dialog and **Exit** the *ADB Validation Checks* screen.

Implementation Actions

Another feature of the *Validation Module*, ***Implementation Actions,*** can help define what a state plans to do for waters that are expected to attain their standards before the next reporting cycle. There is no set list of approved EPA implementation actions, but rather, a state should enter what seems practical. An implementation requirement can be any phrase up to 4000 characters. All implementation actions must have a date (meaning a date by which that action will take place). An AU can have any number of implementation actions. You can only assign implementation actions to AUs that are expected to meet their standards by the next reporting cycle. The implementation actions can be typed directly into the database or you can import a rich text file (.rtf) that you have created with a word processing program.

1. Return to the Validation module by clicking the check icon (if it is already open, it will be on the Start menu bar. Otherwise, open it from ***Start->Programs->ADB v.2->Validate).***

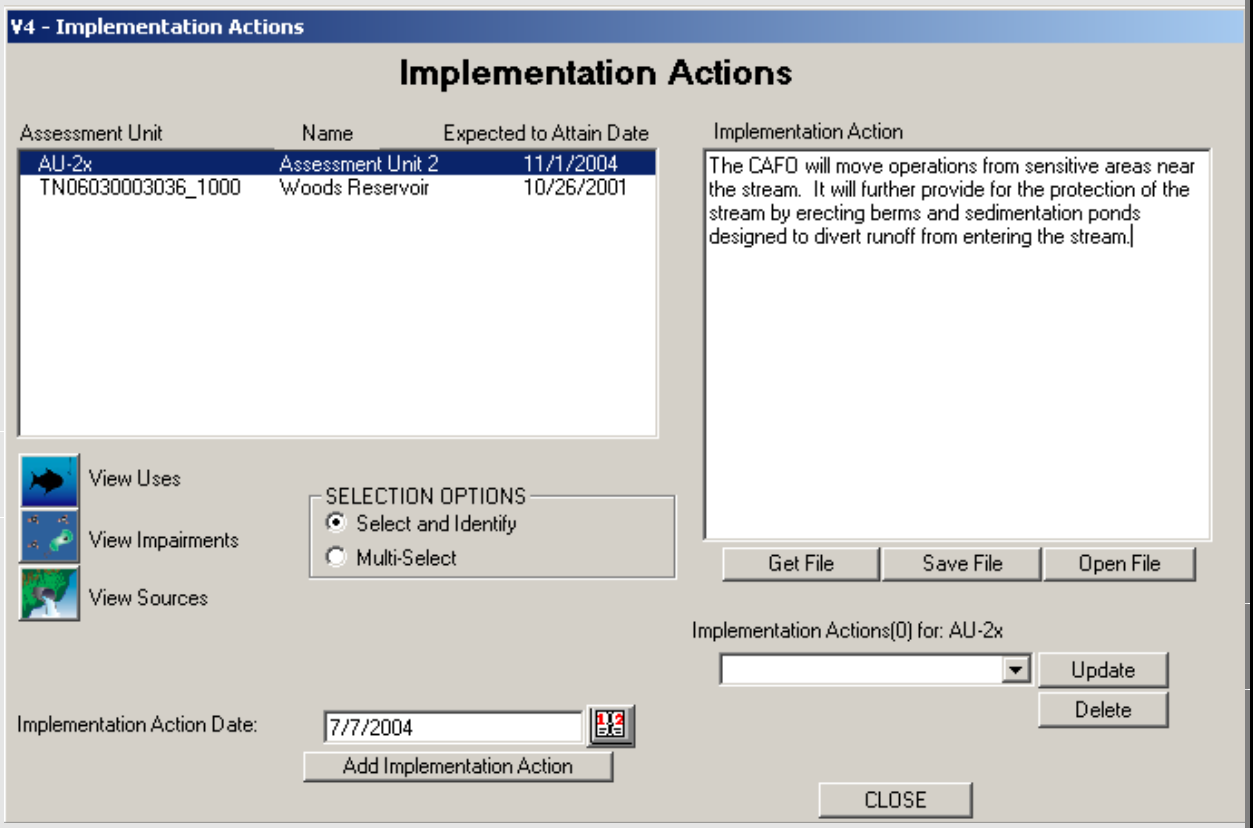
2. Click the **Implementation Actions** button on the *ADB Validation* checks main screen.

The validation module will display the Assessment Units that are in Category 4B - those that have dates entered for *Expected to meet standards by* in the Impairments screen. From this screen you can view the Uses, Impairments, and Sources associated with the assessment unit that you select from the list.

1. Select ***AU-2x***.

2. Click the **Get File** button and navigate to the *implement.rtf* file in your ADB_Sampledata folder. Click **Open**.

3. Enter ***7/7/2004*** in the *Implementation Action Date* box.



4. Click the **Add Implementation Action** button. Click **OK** to dismiss the *Implementation Action Added* message.

This implementation action will be associated with the assessment unit by date and can be viewed from the Assessment Units screen.

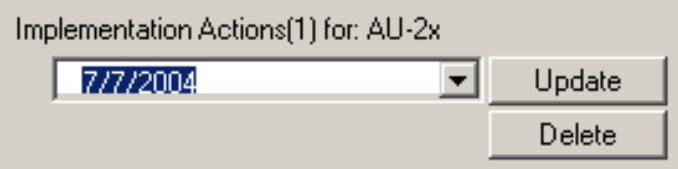
1. Return to the main EPA Assessment Database (if it is no longer open, access it through ***Start->Programs->ADBv.2->ADB v2.***)

2. Click the Assessments button and pick AU-2x from the Search by ID dropdown list. On the left side of the screen, you can see that the "Expected to meet standards by" date is listed.

3. Click the **Implementation Actions** button.

4. Select ***AU-2x.***

5. Pick the ***July 7*** date from the *Implementation Actions for*: dropdown list.



This recalls the information you entered for the implementation action for AU-2x.

This list would will contain multiple dates if several implementation actions with different dates are entered into the database. The number of implementation actions associated with the assessment unit is indicated in parentheses beside the words *Implementation Actions*. When you select a date, the implementation action associated with it will appear in the *Implementation Action* text box.

Summary

In this exercise, you learned about the functionality of the *Validation Module*. You learned how to use the *Finalize Cycle* feature of the Validation Module to check the entries in the database for the presence of required information, and you learned how to enter a required date using the *Enter Dates* feature. You also learned how to add an *Implementation Action* to an Assessment Unit.

This concludes your tour of the ADB v.2. For more information, visit http://www.epa.gov/waters/adb or e-mail owsupport@rti.org.